

# MODERN Machine Shop

HOWARD CAMPBELL, Editor

Volume 8

AUGUST, 1935

Number 3

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More Than  
25,000  
Circulation  
Each  
Issue

Published monthly by Gardner Publications, Inc., 704 Race St., Cincinnati, Ohio. Copyrighted.  
Serial No. 529. Application is pending for acceptance under act of June 5, 1934.

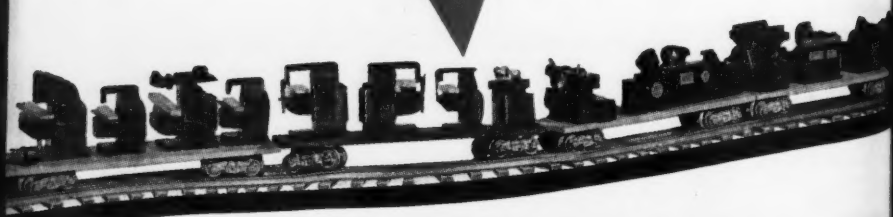
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THE CINCINNATI MILLING MACHINE CO.  
CINCINNATI GRINDERS INCORPORATED  
CINCINNATI, OHIO

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# MODERN Machine Shop

CINCINNATI, OHIO

VOL. 8, No. 3

AUGUST, 1935

## *An Invitation*

*from* CHAS. J. STILWELL,

President, National Machine Tool Builders' Association.

WHEN economists a hundred years from now take inventory of the preceding century, they will probably mark the year 1935 as the starting point of the greatest industrial era the world has ever known.

It has been a little more than a century since the beginning of substantial mechanization in American industry. During that time, which has been marked by a number of business depressions, industrial progress in the United States has been maintained and intensified, for from each period of lessened business activity emerged new products which would not have been given to the

world had there been no time away from normal industrial activities in which to develop them. While



Chas. J. Stilwell

many men are inclined to follow the line of least resistance and to take a period of depression lying down, many others look upon such a period as an opportunity to develop new products, improve existing methods of making old products, provide new services, and prepare for a resumption of industrial and commercial activ-

ity on an increasingly larger scale.

During the years of the depression from which we are now emerging, the creators and builders of machine tools have seized the opportunity to

translate into iron and steel the refinement and improvement in the basic metal working machines which they had visualized in the busy years but, lacking the time in which to experiment, had no opportunity to develop.

The products of this creative genius will be shown in a brilliant setting at the 1935 Machine Tool Show—the world's greatest machine shop in action—for the thousands of engineers, mechanical executives and industrialists who will come from all parts of the world to view the cumulative achievements of America's mechanical genius. For not only have the builders of the Master Tools of Industry created new tools to meet new demands; they also have incorporated in existing tools countless features and developments which increase their precision, lower the production costs and improve the products which they are used to manufacture.

The Machine Tool Show will prove a revelation to thousands of manufacturing executives, and even to those who endeavor to keep themselves informed regarding developments within their industry the educational value of this exposition cannot be over-estimated. New engineering developments, new construction methods, new materials and material applications, new applications of hydraulic, pneumatic, and electric power—all these will be on parade for the benefit of American Industry.

As president of the National Machine Tool Builders' Association it is my pleasure to invite all general industrial executives to Cleveland in September to see the largest industrial exposition the country has ever known—to urge them to attend personally and bring with them their mechanical executives, production heads and skilled technicians in order that they may learn at first hand of the marvels and capacities of today's machine tools.

*Chas. J. Stilwell*



# No Slowing Down No Stopping •

With MODERN MAGIC CHUCKS you make your tool changes while the machine is running at cutting speed. Changes from drill to reamer to tap instantly and safely made with one hand.

MODERN MAGIC CHUCKS give multiple spindle range to single spindle machines.

Drills, reamers, counterbores, taps and other tools are all accommodated and all operations for any one set-up can be performed.

MODERN MAGIC CHUCKS are strong and sturdy. They are of simple construction . . . no complicated parts to wear or get out of order . . . fully guaranteed in service, material and workmanship.

*Write for Bulletin M-100-A*

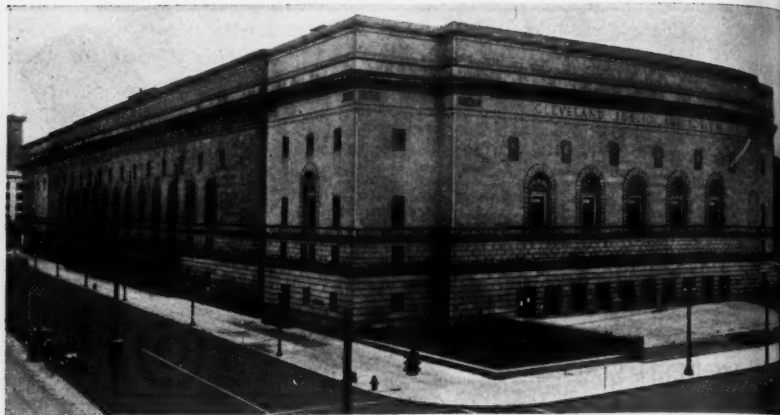
## MODERN TOOL WORKS

561 BLOSSOM ROAD

ROCHESTER, N. Y.

*Division of Consolidated Machine Tool Corporation of America*





Cleveland Public Auditorium

## The Machine Tool Show

*A \$3,000,000 machine shop assembled, powered, and operated for a ten-day period in the interests of better manufacturing, finer products, and lower costs.*

THE greatest industrial exposition ever held in America—the Machine Tool Show—will be held at the Public Auditorium in Cleveland, Ohio, from September 11 to 21, 1935. The show will be sponsored and managed by the National Machine Tool Builders' Association and is intended primarily as an exhibition of the newest types and designs of machine tools, but the exhibits will include small tools, cutters, machine accessories, and other machine shop equipment.

In effect, the Show will comprise a display of the newest and best in

modern metal-working equipment representing the best engineering skill of the world's most progressive age. As such, the Show is important to everyone who is connected with the fabrication of metal products.

To the plant manager, this Show will point the way to better production at lower costs. To the production engineer, it will provide the solution to many problems of quality and quantity. The superintendent of a metal manufacturing plant is expected to keep abreast of the times as regards the newest in production equipment; the master mechanic

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any manufacturing plant is expected to know what tools and methods are available for maintaining his plant at its highest operating efficiency; the department foreman is not serving to the fullest of his possibilities unless he is familiar with developments in his field.

American industry has recently emerged from a period of inertia during which the majority of its factories stood idle. This period offered

an opportunity, however, for American inventors and engineers to develop new principles and ideas which, in busier times, would have been laid aside. The results of these years of experimenting and developing will now be displayed for the benefit of all who are in any way concerned with the fabrication of metals.

The Show will occupy the entire available space in the Exposition Hall and Public Auditorium, comprising 235,000 square feet, or nearly 5½ acres. There will be 238 booths with areas from 200 to 4,000 square feet to the booth, in which will be exhibited machines for making everything in metal from minute parts for small instruments and tiny watches to parts for battleships. Practically all the machines will be under power, providing actual demonstrations of their advantages and possibilities.

Approximately 500 technical experts with 1,000 assistants will be on hand in the various booths to demonstrate the tools and equipment and to provide information regarding the exhibits. This \$3,000,000 machine shop is being assembled, powered, and operated for the mechanical engineer, plant official, and mechanical executive, and everything possible will be done to provide him with all the information he may require.

Manufacturers who are faced with manufacturing or production problems will find the answers in this vast array of equipment. Tools for performing every variety of operation will be seen at work, processing parts of a representative nature.

speeds and heavier

Machines designed to combine higher feeds with finer limits of accuracy will point

the way to lower processing costs. Cutters with blades of the modern alloys and carbides, designed to provide for maintenance of sizes through ingenious devices, will show how tooling costs can be reduced. New designs in plant equipment will present ideas for better management.

The visitor to the Machine Tool Show will leave it with a new appreciation of his task and a broader viewpoint regarding his opportunity for value to himself and his industry.



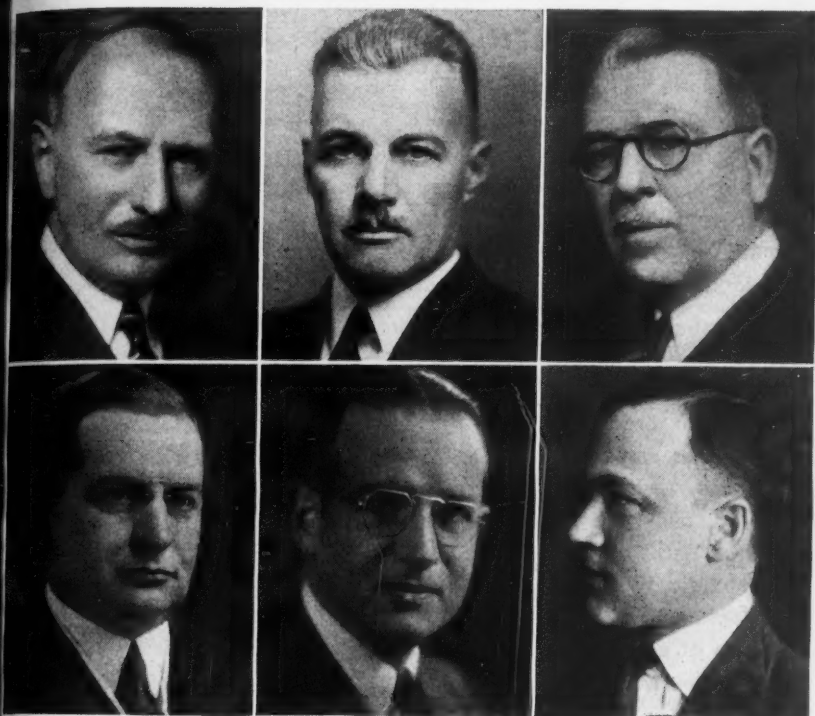
HERMAN H. LIND,  
General Manager, National Machine Tool Builders' Association

August

(Above)  
Abrasive  
(Below)  
Trecker

1200 Oakman Blvd. - Detroit

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### The Exposition Committee

(Above) W. P. Kirk, *Chairman, Pratt & Whitney Company*; Norman D. MacLeod, *Abrasive Machine Tool Co.*; Chas. J. Stilwell, *The Warner & Swasey Company.*

(Below) J. G. Hey, *The Avey Drilling Machine Co.*; Geo. L. Erwin, *Kearney & Trecker Corporation*; W. E. Whipp, *The Monarch Machine Tool Co.*

RESPONSIBILITY for the successful completion of arrangements for the Machine Tool Show has been shouldered by these well-known machine tool builders. It has been their task to work with the show management in planning and assembling this \$3,000,000 Show to ensure that all necessary preparations are made so

that when the doors of the Public Auditorium in Cleveland open at 9 o'clock on the morning of September 11th next, all machines, tools, and other exhibits will be in place and ready for demonstration.

May the glory of their achievement be commensurate with the magnitude of the task.



## An Organization for SERVICE

THE problem of distribution is one of the major problems of present-day civilization. Insofar as the metal-working industries are concerned, however, this problem has been solved in a thoroughly satisfactory manner.

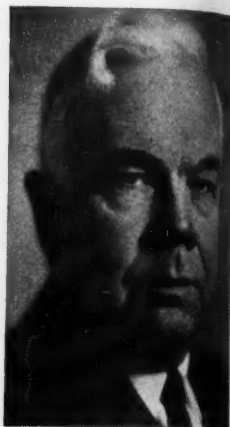
The Associated Machine Tool Dealers, an association whose officers greet you from this page, is an organization of sales engineers who are especially qualified, by virtue of training and experience, to aid the local manufacturer in the selection of equipment to meet his particular requirements. Through



**HARRY BARNEY**  
Barney Machinery Co.  
Secretary-Treasurer



**NORTON A. BOOZ**  
Federal Machinery Sales Co.  
Vice-President



**W. F. MCCARTHY**  
Henry Prentiss & Co.  
President

their organization the Associated Machine Tool Dealers are able to guarantee to the buyer a high standard of business ethics and the benefits of a highly-specialized service.

The machine tool dealer provides a service that is of inestimable value to both the tool manufacturer and the user. It is the dealer's business to know what equipment is best adapted and available for the task in hand. Thus through the local dealer are the manufacturer and his customer brought together to their mutual profit and satisfaction.

Members of the Associated Machine Tool Dealers will be pleased to greet their friends at Booth No. L, in the Arcade.

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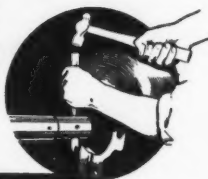


# Wait! Are You Trying to "Save" on Equipment

for Horizontal Boring Mills, Jig Borers, Milling Machines and Radials costing thousands of dollars each? The cost of adjusting single point cutting tools on these machines is a totally unsuspected burden until carefully analyzed. Let us lighten it for you under a definite performance guarantee.

## Primitive . . .

Primitive indeed! Believe it or not, in a few shops men still "adjust" tools in this way on machines costing thousands of dollars.



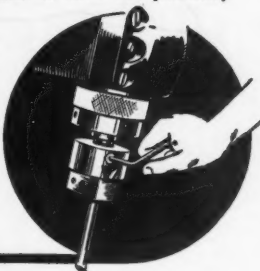
## Wait Until You See

this truly universal Tool Head in action at our exhibit at the Cleveland Show (Space 903) where it will be shown boring, facing, milling, recessing, counter-boring, undercutting, etc.

See "headache" jobs done smoothly and quickly without an instant's fuss or preparation. Watch the operator adjust the moving cutting tool accurately to a fraction of a thousandth for boring, or feed it steadily across or into the work for facing, recessing, etc. — all without stopping the machine.

## A Step Forward . . .

Offset or eccentric boring tool. The obvious first step beyond the hammer method. Machine must still be stopped to make slow, frequent and uncertain tool adjustments with a loose wrench. Introduced about seventy years ago. Absolutely no essential change in sixty years. One exhibited at the Philadelphia Centennial in 1876 was practically identical with the few remaining examples of this type still made, consisting of a body into which a cross slide was dovetailed (a cheap but unsatisfactory construction) and moved by a screw and wrench. Good in its day, but now as completely antiquated as the old-time hand forged flat drill of the same period. The real day-after-day cost of using such obsolete types of equipment in modern shops is appalling when figured honestly on a cost sheet.

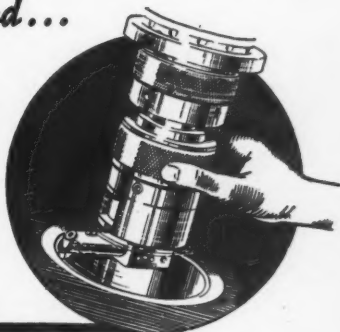


SEE THE PRECISION UNIVERSAL TOOL HEAD also in distinguished company everywhere throughout the Show as approved equipment in actual use on the machines exhibited by such outstanding concerns as:

CINCINNATI MILLING MACH. CO.  
CINCINNATI BICKFORD TOOL CO.  
GIDDINGS & LEWIS M. T. CO.  
KEARNEY & TRECKER CORP.  
PRATT & WHITNEY CO.  
WM. SELLERS & CO., INC.  
REED-PRENTICE CORP.

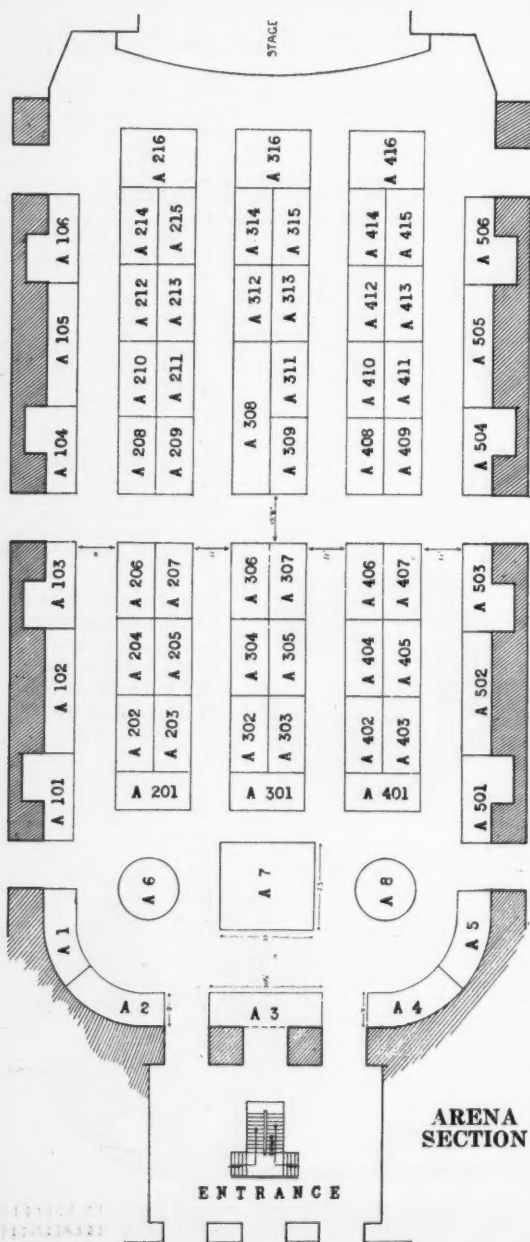
## The Precision Universal Tool Head... ADJUSTABLE WHILE RUNNING!

Fast, accurate and convenient, this up-to-the-second Universal Tool Head is the logical development in pace with present day requirements. It saves time, money and spoiled work and does many jobs that cannot otherwise be done at all without costly special tools and set-ups. It not only bores, but faces, counter-bores, recesses, mills flat surfaces and slots, undercuts, turns outside diameters of hubs and bosses, faces outside shoulders, buckfaces, trepanns, etc., without a moment's set-up or preparation beyond grinding a common tool bit. Built of chrome-nickel steel, hardened and ground throughout, simple, compact, rugged, yet super-accurate, one size takes care of every type of internal or external operation on all diameters from  $\frac{1}{16}$ " to 16".



Send for bulletins showing difficult and unusual jobs done in unbelievably fast time with this truly Universal Tool Head.

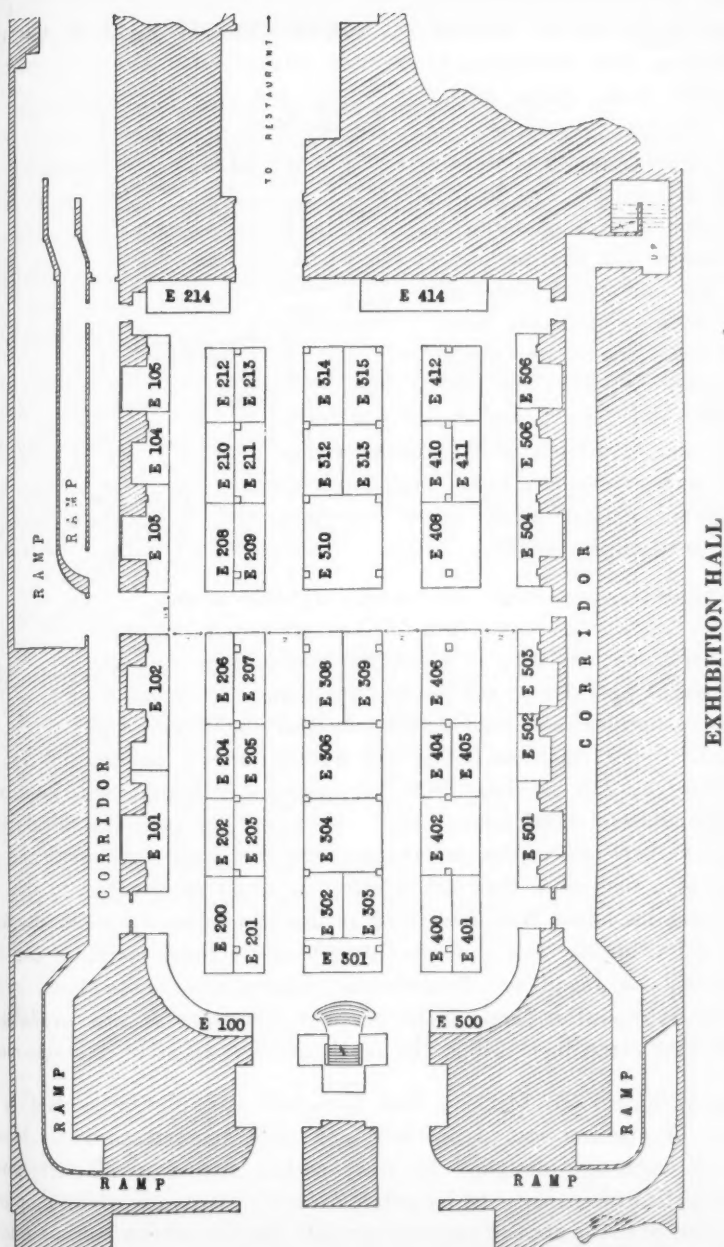
THE PRECISION TOOL COMPANY BRIDGEPORT CONNECTICUT



## Floor Plans of the Machine Tool Show

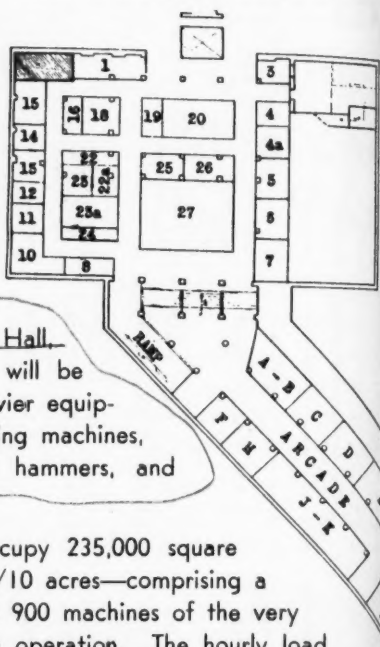
THE exhibits comprising the 1935 Machine Tool Show will occupy three sections; the Arena, the North Exhibit Hall and Exhibition Hall (which are on the same level and in the same building), and the New North Annex.

The sole entrance to the Show is from Lakeside Avenue, and leads directly into the Foyer and thence into the Arena, which is on the street level. The North Exhibit Hall and Exhibition Hall are below the Arena, and are reached by means of a stairway from the Arena. From the North Exhibit Hall, which is below the street level, an Arcade underneath Lakeside Avenue leads to the New North Annex, for brevity referred to elsewhere in this issue simply as the "North Annex."



The Arena will be devoted to machine shop accessories—materials, tools, gages, bearings, motors, attachments, power transmission equipment, steels, and so on. The Exhibition Hall, directly underneath the Arena, will also be occupied by exhibits of materials, tools, accessories, trucks, lubricants, coolants, and similar equipment. The North Exhibit Hall, Arcade, and New North Annex will be given over to exhibits of the heavier equipment, such as machine tools, forging machines, presses of various kinds, power hammers, and other production machines.

## NORTH EXHIBIT HALL &amp; ARCADE



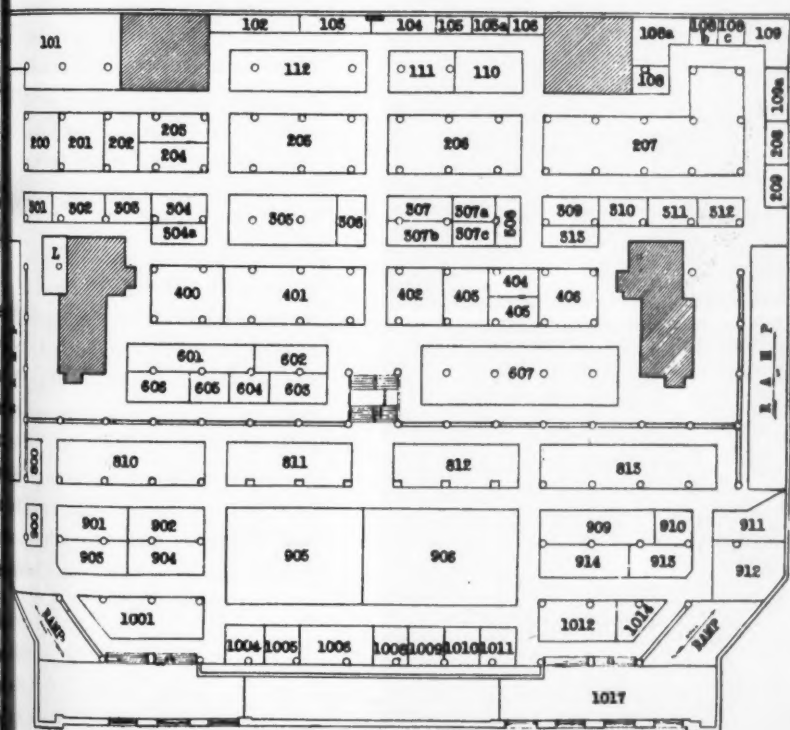
Altogether, the exhibit will occupy 235,000 square feet of floor space—equal to 5-3/10 acres—comprising a \$3,000,000 machine shop in which 900 machines of the very latest types and design will be in operation. The hourly load when the machines are under power will require 5,000 kw. of electric current. These machines, tools, and accessories will be brought to this Show by 238 individual firms, occupying 238 booths with floor area of from 200 to 4,000 square feet. Here will be seen the products of America's best engineering talent—products that were developed and produced at a time when their entire attention could be devoted to this task. Here will be found the answers to problems relating to methods, accuracy, finish, quality, and quantity. And here—in these machines and the tools—will be found the fundamental reasons why automobiles, radios, electric refrigerators, and similar modern conveniences are available at prices that place them within the reach of the person of average means.

The visitor to the Machine Tool Show will find that precedent in the matter of machine tool design has long since been discarded. Modern machine tools are designed to meet certain requisites of performance. Conservation of energy is an important factor in modern machine shop practice; thus power is applied to every possible function of the modern machine.

tool. Electricity, hydraulics, and pneumatics have been applied to the operation of rams, chucks, spindle and carriage feeds, jig, fixture, and vise operation, and so on.

Safety, too, is an important factor in present-day machine design, and no method, design, or device is considered acceptable unless it has first been proved safe. The safety appliances alone will be worth a visit to the show for many plant executives.

Not the least important in this mammoth display of metal manufacturing equipment are the exhibits of tools and accessories. Keeping step with the advances in the design of the machine tools are new developments in cutters, gages, inspection instruments, heat treating methods and materials, and other accessories to machine shop operation. No mechanical engineer or executive can afford to miss the 1935 Machine Tool Show.





## PIONEERING BEYOND INDUSTRY'S HORIZON

*The Carborundum Company  
realizes its responsibility to the  
machine tool industry*

THE constant aim of the organization is to develop and investigate new abrasive materials—new combinations of bond and abrasive—to set new precedents for productive performance. This is termed Research.

A new grinding machine, a new steel, iron or alloy is produced—new tools and parts come into being over night—their introduction presents new grinding problems calling for a new series of grinding wheels—a new grinding technique. Carborundum must be ready ahead of time.

Carborundum engineering service must put the right wheel in the right place for every grinding job—from hair split precision of centerless, cylindrical, internal and to room work to the heavy snagging jobs of the foundry.

Carborundum engineering facilities are available to the machine tool builder, the metallurgist—to all who are pioneering beyond present horizons.

THE CARBORUNDUM





## ANNOUNCING TWO NEW TOOL ROOM WHEELS

THIS improved Aloxite Brand "AA" Wheel has a clean, pure white color.

The improved "AA" Grain, with the new "170 bond", gives a wheel freer in its cut with greater ease of penetration requiring less pressure. It has less bond interference—the newly developed aluminum oxide grain getting a real chance to go into action.

It is balanced as to grain, bond and structure with just the right self-sharpening characteristics. It has maximum flexibility—taking light to heavy cuts with the same decided efficiency with low wheel wear. It handles a wider range of steels and wider areas of contact.

It requires less dressing, saving time and diamonds. It generates less heat which results in less work distortion and checking. It has all of the "niceties" that a great tool room wheel should have.

### *The New "270 Bond" Tool Room Wheel*

A new production wheel for the tool room. The "Blue Wheel" is made of a new type of aluminum oxide abrasive combined with the "170 bond" and known as the "270 Bond"—the Blue Wheel. To be used where there is a duplication of grinding operations and where flexibility is not essential. Fast, clean cutting, long lived, economical. The "AA"—"170 Bond" wheel for special jobs. The "270 Bond" wheel for production.

*Visit our Exhibit  
Booth E-408*

Many outstanding examples of grinding. The wheels which did the work. Study them at the Machine Tool Show.

(Carborundum and Aloxite are registered trade-marks of The Carborundum Co.)

COMPANY NIAGARA FALLS, N. Y.

# List of Exhibitors

at the

## Machine Tool Show of 1935

**Abrasive Machine Tool Co., The**  
East Providence, R. I.

**Booth No. 405, North Annex**  
Norman D. MacLeod, Pres. and Gen. Mgr.;  
Kenneth B. MacLeod, Vice Pres.; C. Gordon MacLeod, Sec. and Treas.

**Acme Machine Products Company, Inc.**  
Muncie, Ind.

**Booth No. A-312, Arena**  
Earl A. Munger, Pres.; J. H. Broderick, Sec. and Treas.; Francis Brady, Chief Eng.; Mark Spraley, Sales Mgr. Pump Div.

**Acme Machinery Company, The**  
Cleveland, Ohio

**Booth No. 311, North Annex**  
D. R. Davies, Pres. and Treas.; K. F. Bruch, Vice Pres.; H. N. Anderson, Sales Manager; E. P. Bruch, Sec.

**Acme Machine Tool Co., The**  
Cincinnati, Ohio

**Booth No. 109A, North Annex**  
Fred Winkelman, Sales Engineer; Lee Leon, Sales Engineer; Howard Volz, Demonstrator; Charles Meier, Gen. Mgr.

**Ahlberg Bearing Company**  
Chicago, Ill.

**Booth No. E-301, Exhibition Hall**  
C. J. Bender, Pres.; F. O. Burkholder, Vice Pres.; B. S. Okner, Chief Eng.; Chas. Nelson, Jr., Asst. Chief Eng.; P. H. Staerk, Field Representative.

**Air Reduction Sales Co.**  
New York, N. Y.

**Booth No. A-412, Arena**

**Ajax Manufacturing Co., The**  
Cleveland, Ohio

**Booth No. F, Arcade**  
J. R. Blakeslee, Pres.; Harris Creech, Treas.; H. D. Heman, Vice Pres.; C. K. Dissette, Sec.; W. W. Criley, Gen. Mgr.

**Allen Co., Chas. G.**  
Barre, Mass.

**Booth No. 15, North Exhibit Hall**  
Chas. G. Allen, Gen. Mgr. and Treas.; Chas. G. Allen, Jr.; Clarence M. Allen; John S. Weeks.

**Allis-Chalmers Manufacturing Co.**  
Milwaukee, Wis.

**Booth No. E-401, Exhibition Hall**

**Allis Co., The Louis**  
Milwaukee, Wis.

**Booth No. E-411, Exhibition Hall**  
Charles F. Norton; R. J. Owen; Glaser; L. F. Keely; V. B. Hooper.  
**American Broach & Machine Co.**  
Ann Arbor, Mich.

**Booth No. 1005, North Annex**  
F. J. Lapointe, Pres.; David A. DeLong

**American Chain Company, Inc.**  
(Wright Mfg. Div.)  
Bridgeport, Conn.

**Booth No. A-305, Arena**

**"American Machinist"**  
New York, N. Y.

**Booth No. A-7, Foyer**  
Mason Britton, W. E. Kennedy, McGhie, Kenneth H. Condit, Fred E. John Haydock, H. R. LeGrand, G. F. enholt, Leonard Church, Roger Fox, Weatherby, James A. McGraw, W. S. Faddin, R. Deen, Eldridge Haynes.

**American Tool Works Company, The**  
Cincinnati, Ohio

**Booth No. 901, North Annex**  
J. B. Doan, Pres. and Gen. Mgr.; Robert Alter, Vice Pres.; L. W. Scott Alter, to the Pres.; Henry Luers, Sec. and A. E. Robinson, Works Mgr.

**Armstrong Bros. Tool Company**  
Chicago, Ill.

**Booth No. A-304, Arena**

**Arter Grinding Machine Co., The**  
Worcester, Mass.

**Booth No. 108, North Annex**  
William Arter, Pres.; Harry Arter, Pres.; A. B. O'Donnell, Sales Mgr.; ren F. Fraser, Works Mgr.

**Associated Machine Tool Dealers**  
New York, N. Y.

**Booth No. L, Arcade**

**"Automotive Industries"**  
Philadelphia, Pa.

**Booth No. A-2, Foyer**

**Avey Drilling Machine Co., The**  
Cincinnati, Ohio

**Booth No. 18, North Exhibit Hall**  
L. B. Patterson, Pres. and Treas.; J. C. Vice Pres. and Gen. Mgr.; D. A. Patterson; J. F. Mirrieless, Supt.

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**Booth No. 307B, North Annex**  
 Baker, Pres.; G. E. Hallenbeck, Vice  
 Pres. and Gen. Mgr.; A. L. Baker, Vice  
 Pres.; R. K. Chapman, Sec. and Treas.;  
 L. Tigges, Sales Mgr.  
 er-Raulang Company, The  
 Cleveland, Ohio  
**Booth No. E-212, Exhibition Hall**  
 er-Colman Company  
 Rockford, Ill.  
**Booth No. 903, North Annex**  
 W. Dickover; H. K. Sorenson; M. N.  
 ough; C. S. Morey; T. R. Hodges; E. F.  
 nderoth; F. R. Ridgley; William Brew-  
 er; R. B. Squires; M. C. Conwell; R. A.  
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 es Drill Co.  
 Rockford, Ill.  
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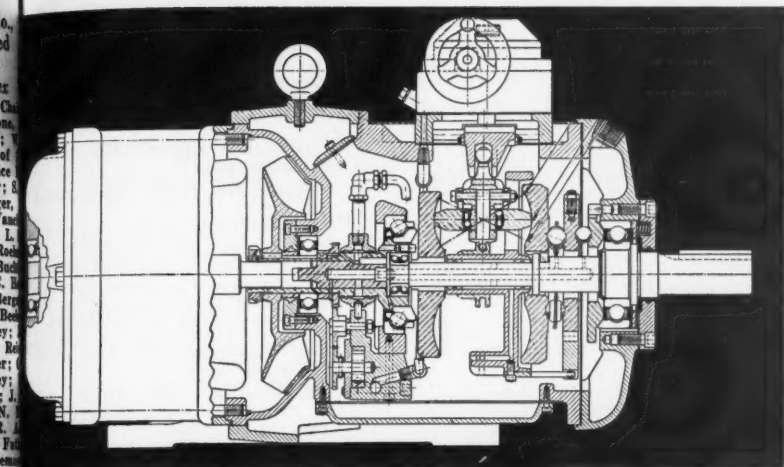
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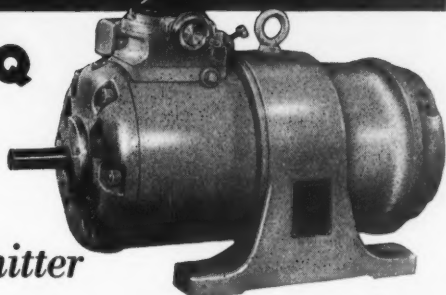
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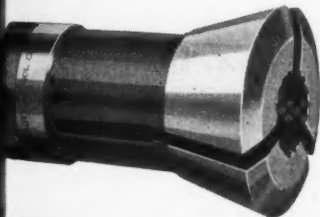
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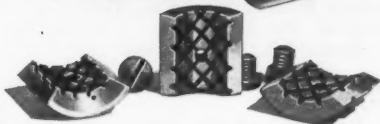
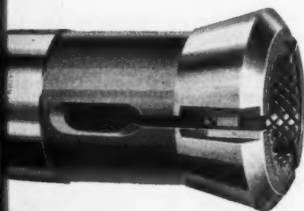
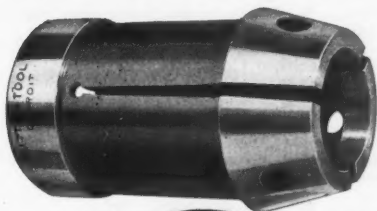


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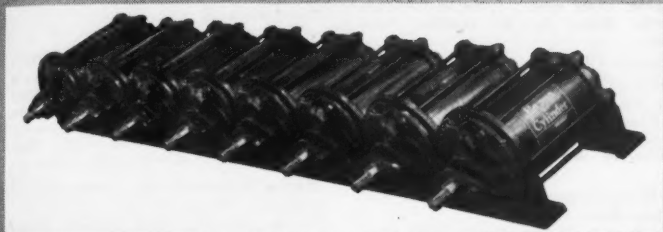
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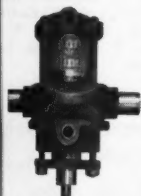
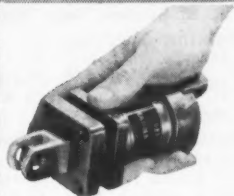


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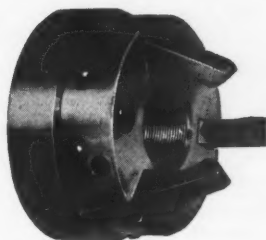
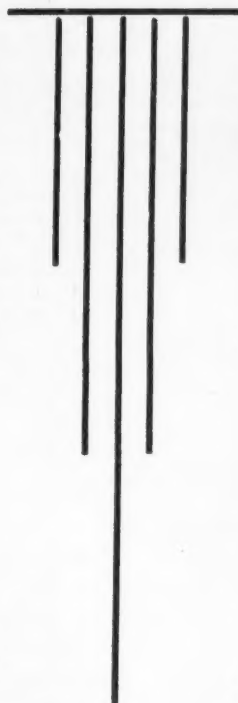
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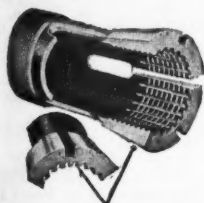
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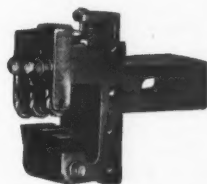
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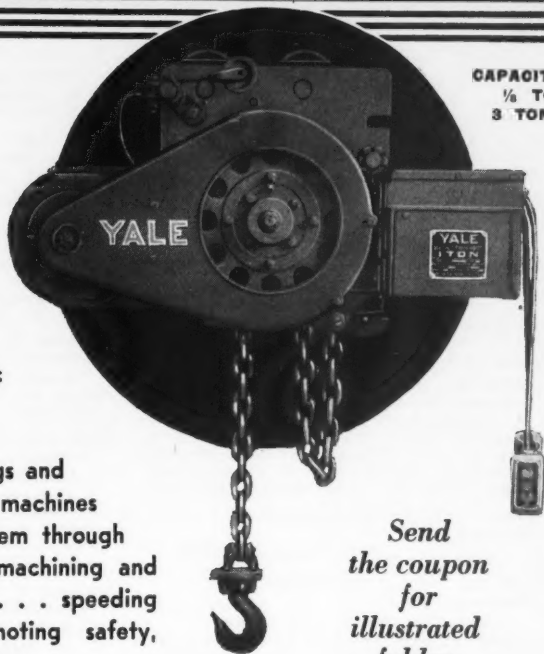
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**Booth No. A-404, Arena**

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**Taft Peirce Mfg. Co., The**

Woonsocket, R. I.

**Booth No. A-307, Arena****Taylor & Fenn Co., The**

Hartford, Conn.

**Booth No. 604, North Annex**

Charles L. Taylor, Pres. and Treas.; DeLany, Sales Mgr.

**Thompson Grinder Company**

Springfield, Ohio

**Booth No. 24, North Hall**

C. Baldenhofer, Pres. and Gen. Mgr.; V. Baldenhofer, Vice Pres.; R. M. McDonald, Sec.

**Timken Roller Bearing Company, The**

Canton, Ohio

**Booth No. E-500, Exhibition Hall**

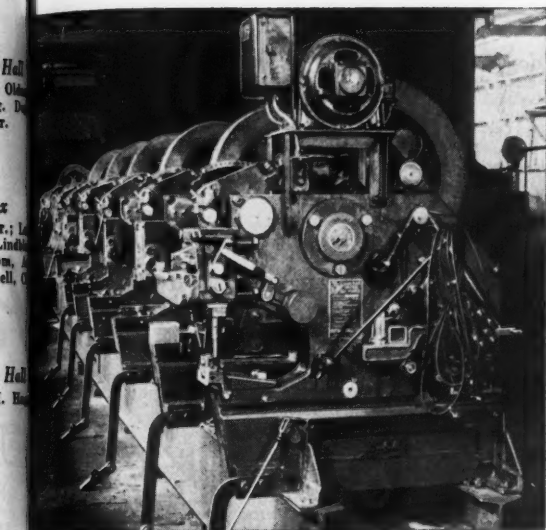
L. M. Klinedinst, Vice Pres.; W. B. McMillan, Gen. Mgr. Industrial Div.; J. L. Taylor, Asst. Gen. Mgr., Industrial Div.; S. Weckstein, Asst. Chief Eng.

**Toledo Pipe Threading Mch. Co., The**

Toledo, Ohio

**Booth No. 108-C, North Annex**





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Put one of these Universal Iron Workers to work in your plant and watch punching and cutting costs drop un-

believably! Hundreds of users have paid for a Buffalo Iron Worker with less than a year's savings—and some of the machines have been in use for fifteen to twenty years!

You can cut plates or flats, punch holes, cut bars with this machine—keeping three men busy at one time. Cuts are clean and quick—holes are perfect. Workmen like the machine because it saves time for them, as well as for you. Practically all adjustments are made without use of wrenches.

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## Universal Iron Workers

**Toledo Scale Company**

Toledo, Ohio

**Booth No. E-309, Exhibition Hall**

H. D. Bennett, Pres.; L. J. Colenback, Vice Pres.; M. E. Holmes, Mgr. Industrial Sales; H. C. Mathias, Chief Sales Eng.; D. H. McGhee, Cleveland District Sales Mgr.; M. A. Weckerly, Eng.; H. O. Hem, Eng.; William Summersett; Theodore Kerste; P. S. Whelan; G. R. Barr; F. G. Owen; W. A. Ray; R. B. Longmate; G. W. Crockatt; E. H. Schellberg.

**"Tool Engineer, The"**

Detroit, Mich.

**Booth No. A-6, Foyer****Tuthill Pump Company**

Chicago, Ill.

**Booth No. A-204, Arena****Twin Disc Clutch Co.**

Racine, Wis.

**Booth No. E-404, Exhibition Hall****Union Manufacturing Company**

New Britain, Conn.

**Booth No. A-311, Arena**

Carl S. Neumann, Pres.; Edward I. Stevens, Sales Dept.; A. E. Church, Chief Eng.

**United States Electrical Tool Co.**

Cincinnati, Ohio

**Booth No. 102, North Annex**

George E. Smith, Sales Dept.; L. E. Fries, Cincinnati District Mgr.

**Universal Boring Machine Co.**

Hudson, Mass.

**Booth No. 304, North Annex**

Leon F. Marah, Vice Pres.; Warren B. Robins, Service Eng.; Waman S. Hassett.

**V & O Press Company, The**

Hudson, N. Y.

**Booth No. E-315, Exhibition Hall**

Herman Osswald, sr.; C. R. Phiffer; B. B. Patten; E. N. Ekdahl; J. L. Giffen; H. F. Zorn.

**Vanadium Alloys Steel Company**

Latrobe, Pa.

**Booth No. E-102, Exhibition Hall**

R. C. McKenna, Pres.; Floyd Rose, Vice Pres.; Lawrence Wood, Asst. to Vice Pres.; J. P. Gill, Chief Metallurgist; R. B. George, Metallurgical Eng.; W. R. Mau, Mgr. Vascloy-Ramet Sales Div.

**Van Dorn Electric Tool Co.**

Towson, Md.

**Booth No. E-101, Exhibition Hall**

W. J. Fenwick, Sales Representative; George Stoiber, Sales Representative; J. F. Spaulding, Sales Representative; F. R. Stoiber, Sales Representative; J. F. Apsey, Jr., Adv. Mgr.

**Van Norman Machine Tool Company**

Springfield, Mass.

**Booth No. 913, North Annex**

C. E. Van Norman, Pres.; F. D. Van Norman, Vice Pres.; J. Y. Scott, Vice Pres.; G. Hoglund, Sales Mgr. Machine Tool Div.; L. F. Hunderup, Sales Mgr. Automobile Div.; R. S. Pyne, Sales Eng.; O. S. Johnson, Factory Mgr.; F. P. Healy, Sales Mgr.; H. Bordeaux, Chief Eng.

**Vickers, Inc.**

Detroit, Mich.

**Booth No. E-412, Exhibition Hall****Walker Co., Inc., O. S.**

Worcester, Mass.

**Booth No. 3, North Hall**

W. B. McSkimmon, Pres.; J. H. Drury, Vice Pres.; C. O. Smith, Sec. and Treas.; H. Tracy, Chief Eng.

**Warner & Swasey Company**

Cleveland, Ohio

**Booth No. 905, North Annex**

P. E. Bliss, Pres.; Charles J. Stilwell, Vice Pres.; Clifford S. Stilwell, Sales Mgr.; W. Gressle; J. R. Longstreet; M. E. Long; W. K. Bailey; L. M. Cole; A. L. Evans; E. R. Gardner; L. R. Hawkins; G. Herkner; A. H. Keetch; G. Kochenderfer; E. F. Kunze; J. E. Kunze; W. L. Long; D. M. Pattison; F. J. Pelich; A. Schuman; J. F. Slavik; R. Strang; E. Ward; E. C. Wilson.

**Wesson Company**

Detroit, Mich.

**Booth No. A-209, Arena**

J. Hugo Smith, Pres.; G. R. Smith, Dist. Office; J. G. Weeks, Detroit Office; W. Schofield, Detroit Office.

**Westinghouse Electric & Mfg. Co.**

East Pittsburgh, Pa.

**Booth No. E-304, Exhibition Hall****Whitney Mfg. Co.**

Hartford, Conn.

**Booth No. A-315, Arena****Whitney Metal Tool Co.**

Rockford, Ill.

**Booth No. 16, North Hall**

John Jensen, Secretary.

**Wiedemann Machine Co.**

Philadelphia, Pa.

**Booth No. E-313, Exhibition Hall**

Theo. A. Wiedemann; Ernest J. Rabinovich.

**Williams & Co., J. H.**

New York, N. Y.

**Booth No. A-410, Arena****Wilson Mechanical Instrument Co.**

Bronx, N. Y.

**Booth No. E-104, Exhibition Hall****Yale & Towne Manufacturing Co.**

Philadelphia, Pa.

**Booth No. E-100, Exhibition Hall**

# THE REVOLUTION

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In six years, a revolution has quietly come to pass—a profound revolution in the production world. So swiftly has it occurred that few yet realize its import.

Yet because of it, production methods in America can never be what they have been.

The six years since 1929 have seen epoch-making advances in machine tools and accessories. For the first time, at the Machine Tool Show of 1935, these remarkable developments will be shown: 900 different primary machines, of 600 different types, in operation beneath one roof for those who seek the way to better products at lower costs that will profitably provide more goods to wider markets.

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## MACHINE TOOL SHOW

CLEVELAND

SEPTEMBER 11-21, 1935

# McCROSKY BLOCK BORING BARS



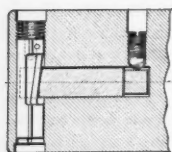
Centering  
Key



Cutter Block

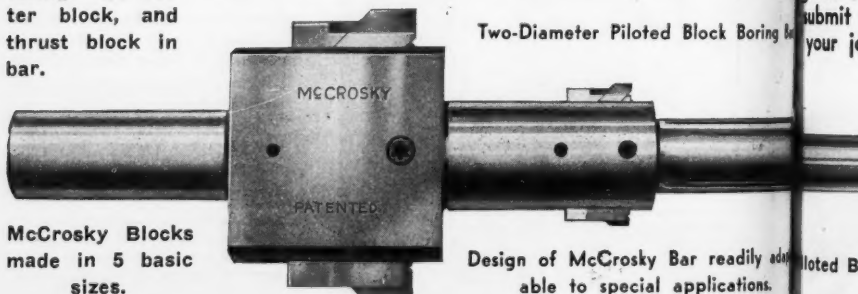


Thrust  
Block



Cross section view showing relation of centering key, cutter block, and thrust block in bar.

McCrosky's new and improved design of centering key locates and locks the cutter block in the bar with extreme accuracy . . . Cutting thrust is not taken by centering key but by hardened thrust block between cutter block and the rear wall of slot in the bar . . . The centering key remains permanently in the bar. The cutter block can be inserted or removed without disturbing it . . . The cutter block can be locked rigid or be given a controlled amount of float. . . . An exclusive method of adjusting blades provides accurate and economical adjustment . . . McCrosky Blocks are hardened.



Two-Diameter Piloted Block Boring Bar

McCrosky Blocks made in 5 basic sizes.

Design of McCrosky Bar readily adaptable to special applications.

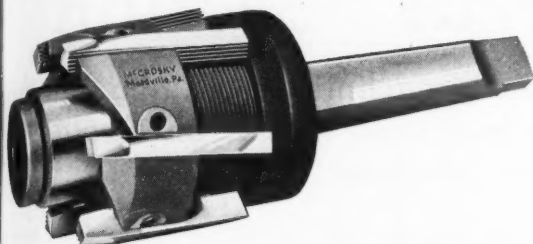


Boring Bars  
Floating Holders  
Special Inserted Blade Cutting  
Send for descriptive bulletins

SUPER Adjustable

## McCROSKY TOOL COMPANY

# SPECIAL SERRATED BLADE TOOLS



With  
McCrosky  
**Lift-  
Wedge  
Lock**

patented

Combination Counterbore and Hollow Mill

Lift-Wedge, a special McCrosky development for lock-serrated blades in a tool body, is simple in design and operation. Semi-circular in shape, it occupies a recess in the tool body. A headless set-screw in the wedge bears against the bottom of the recess. Turning the screw forces the wedge powerfully up and over against the blade . . . The pressure of the wedge can be quickly released by withdrawing the screw and tapping the wedge down into the recess. Blades locked with the lift-wedge can be adjusted or relocked for regrinding with extreme rapidity . . . The wedge is applicable to a wide variety of special purpose tools: boring and reaming bars, counterbores, hollow bars, inserted blade milling cutters tipped with cemented carbide, etc. Send us your work prints and let us submit layouts of lift-wedge tools specially designed for your jobs.



Cross section view of lift-wedge and blade showing powerful pressure exerted against blade by lifting wedge in body



Fluted Boring Bar with serrated blades locked with McCrosky Lift-Wedge

Hard Quick-Change Chucks, Friction Drive Holders, Turret Tool Posts, Self-Centering Vices. Send for descriptive bulletins.

**McCrosky, Meadville, Pa.**

**McCrosky**



## "Prevue" Section

*A pre-view of new machines, tools, and machine shop accessories that will be on display at the Machine Tool Show*

**Jones & Lamson Machine Company**  
Springfield, Vermont

**Booth No. 607, North Annex**

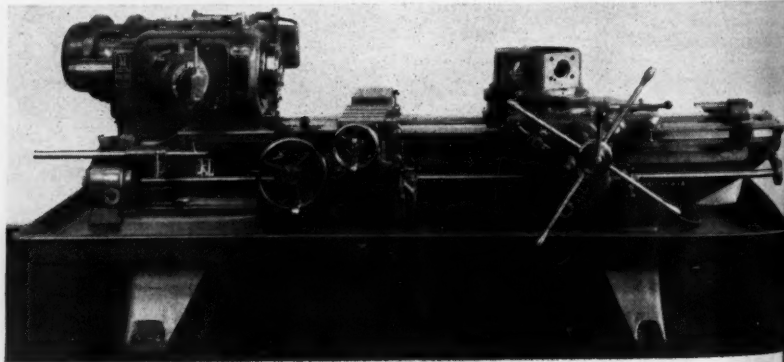
Included in this exhibit will be a new Jones & Lamson Saddle Type Turret Lathe which has just been developed by this firm. The machine is built for 2½-in. bar capacity and is fitted with a 12-in. chuck when used for chuck work. The features of the machine include single lever speed and feed selectors with direct reading dials and 12 spindle speeds forward and reverse. All variable speeds are obtained through sliding gears mounted on multiple splined shafts. All gears and shafts in the head stop are hardened and all shafts are mounted on anti-friction bearings. The main spindle is mounted on pre-loaded bearings.

The bed is of double box-rib construction, equipped with hardened ways. The carriage and saddle bear on the top of the ways, alignment being obtained by bearing against the vertical side of the front way.

The universal carriage is equipped with a heavy duty slide for mounting of

tools on front and back. The apron is equipped with a sliding gear transmission providing nine variable speeds, ranging from 0.005 to 0.100 in. on the longitudinal travel and from 0.0025 to 0.01 in. on the cross travel. The apron and carriage are lubricated with a splash and force feed system which also lubricates the ways for the cross slide, ways of the bed, and all operating surfaces. Thread chasing or paper turning attachments can be installed on this machine.

The saddle has wide, long bearing surfaces on the ways. It is equipped with a six-station hollow hexagon turret with a power traverse which provides two speeds in both directions. All movements of the power traverse are controlled with a lever located in the center of the star wheel, and when the power traverse is engaged, the star wheel automatically disengages. Six automatic stops are arranged; one for each position of the turret and three additional manually operated stops which can be selected for any one position of the turret. The machine can be supplied with power units consisting of a flanged type



**Jones & Lamson Saddle Type Turret Lathe**



motor, motor in cabinet leg with V-belt, for counter shaft drive.

## The Cincinnati Bickford Tool Co.

Cincinnati, Ohio

Booth No. 406, North Annex

Included in the Cincinnati Bickford

Exhibit are: Two 24-in. Super - Service Upright Drills; One 4-ft. Super-Service Radial Drill; One 6-ft. Super-Service Radial Drill; One 3-ft. High-Speed, All-Gear Super-Service Radial Drill.

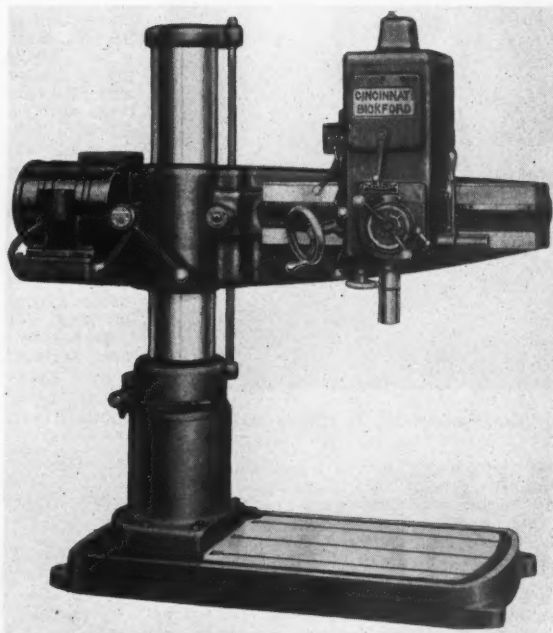
The new High-Speed, All-Gear Super-Service Radial Drill has a 9-in. diameter column. Spindle speeds are available up to 3500 r.p.m. without the use of belts, all speed changes being made at the head through heat-treated, alloy steel sliding gears. All nine of the spindle speeds are controlled by means of a single lever. Any one of the five speed ranges is available at the option of the user. The option of two feed ranges is also offered. Feed changes are made through sliding gears in the head, controlled by a single lever. All shafts are of the multiple integral key type and all bearings are anti-friction.

The balanced arm and head are easily and rapidly handled. The head is mounted on anti-friction bearings, rolling on hardened steel armways. The feed engagement clutch is of the positive type which can be engaged at any position with but a small amount of effort. Automatic disengagement of the power feed is governed by a graduated dial depth gauge.

The spindle, which is of chrome nickel steel, is mounted on precision anti-friction bearings. Accuracy and rigidity are insured by an exceptionally long spindle-sleeve bearing at the bottom of the head. The feed rack is integral with the spindle sleeve and the spindle and sleeve are counterweighted for fast, easy operation.

A distinctive feature of this machine consists in that no forward or reverse

spindle driving clutches are required, a reversing motor supplying the necessary flexibility. Built-in push buttons controlling the forward and reverse rotation and the stopping of the spindle are controlled by a lever at the lower left of the head. Spindle reverse through a reversing motor is extremely fast and thus highly efficient for tapping.



Cincinnati Bickford High-Speed, All-Gear Super-Service Radial Drill

## Van Norman Machine Tool Company

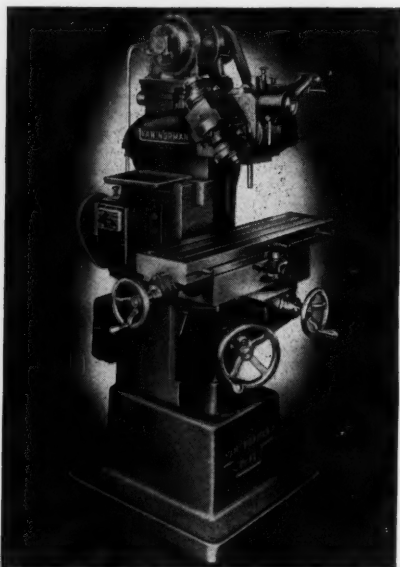
Springfield, Mass.

Booth No. 913, North Annex

The display at this booth includes the following Machines: Van Norman No. 6 Milling Machine; Van Norman No. 12 Milling Machine; Van Norman No. 22 Universal Milling Machine; Van Norman No. 32 Universal Milling Machine; Van Norman No. 72 Internal Oscillating Radius Grinder; Van Norman No. 33A External Oscillating Radius Grinder.

The No. 6 and No. 12 machines are of similar designs, the No. 6, however, be-





Van Norman No. 12 Milling Machine

ing the smaller of the two. The No. 6 machine retains all the characteristics of the larger machines with the exception that no power table feed is available. The main drive motor is mounted on top of the ram and drives the ram gears through a heavy v-belt. The gears run in a bath of oil. Nine speeds are available ranging from 80 r.p.m. to 1450 r.p.m.

The column of the No. 12 Miller is larger and heavier than on previous machines. The saddle, which is 21 in. in length, has been completely redesigned to provide additional rigidity of support for heavier table loads. It contains a simple, sturdy table feed operating mechanism driven by worm and gear. A positive sliding jaw clutch operated by a simple reversing and stop mechanism controls the feed of the table, either by hand or automatically.

The table, 33 inches long by 8½ inches wide, is supported on generous ways. Power feed is provided for the table longitudinal travel. The drive from motor to gear box consists of a silent, self-oiling chain. Anti-friction bearings are provided throughout.

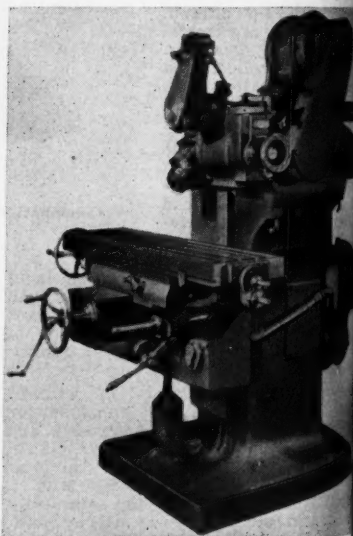
Twelve feed changes are available through conveniently located levers. Sliding gears controlled by two quick-

change shifting levers provide for speeds ranging from 70 r.p.m. to 1450 r.p.m. It is impossible for the operator to secure combinations of gears which might result in broken teeth. Cutter head drive gears are of spiraloid type assuring smooth and quiet application of power to the cutter.

The cutter head is adjustable to any angle between its vertical and horizontal positions. Taper roller bearings at each end of the spindle provide a firm, smooth drive to the cutter. The No. 12 Miller has been designed for ease and convenience of operation. Dials are large and legible for quick and accurate adjustments. Control levers are placed for easy and convenient manipulation.

The No. 22 Van Norman Milling Machine is shown as arranged for motor drive, the motor required being 3 h.p. 1200 r.p.m., electrically reversible standard construction. The ram of the machine is 32 in. in length and has a maximum travel of 18 inches. The overhanging arm is 3½ in. diameter by 4 in. long. The swivel cutter head is adjustable to any angle between vertical and horizontal.

The feed mechanism is driven by a compact, motor-operated gear box mounted on the back of the machine.

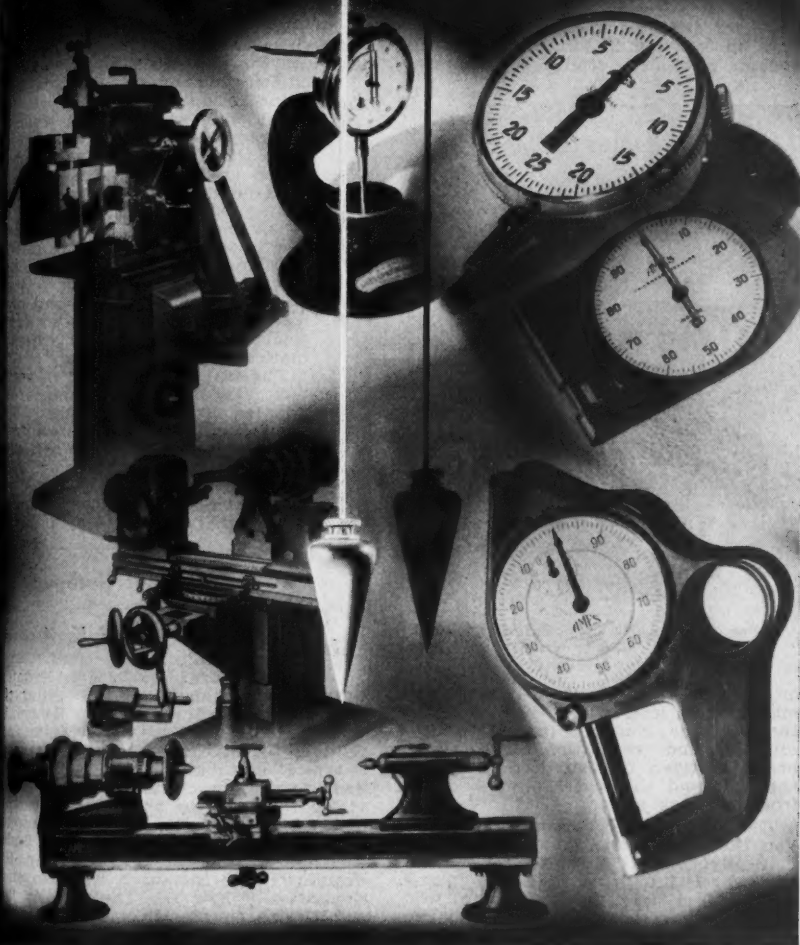


Van Norman No. 22 Universal Milling Machine

recision  
ears by

C.

# PRECISION

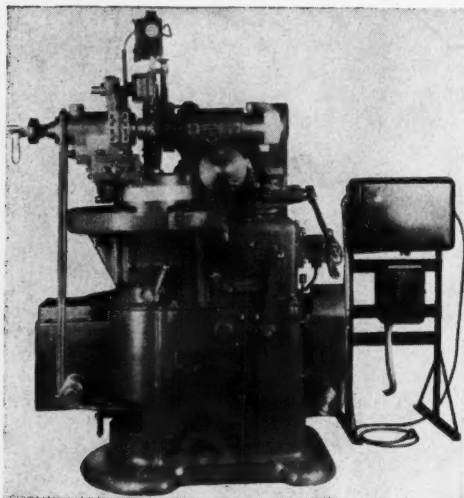


Precision in industry has been advanced during more than forty years by Ames products—gauges, bench lathes, millers and shapers. Look to Ames for Accuracy.

**A. C. AMES CO., WALTHAM, MASS.**

Sixteen feed changes are obtainable by means of four convenient levers. All gears are of heat treated, oil hardened steel and run in an oil bath. Nine speed changes are available, from 40 r.p.m. to 1100 r.p.m.

The No. 33A Van Norman Oscillating Grinder is a heavy, rigid, compact machine for grinding small size cone race-ways up to about  $2\frac{1}{2}$  in. diameter. The work is held in a stud arbor mounted



Van Norman No. 33A External Oscillating Radius Grinder

on the ball-bearing work head of the machine. A lever at the right front of the machine controls the work head rotation and oscillation. The work head is driven by belt from motor in the base and the wheel head is driven from the back motor.

The machine is equipped with the Van Norman electric gauge which automatically controls the size and feed of the wheel into the work. A coarse, ruffing feed is used until the work reaches a given size, then a finer finish feed is automatically applied. The feeds are automatic and each cycle can easily be adjusted.

The Van Norman electric gauge functions by direct contact of two diamonds with the surface being ground. The diamonds contact the work throughout the grinding cycle and operate two sets of electric contacts which control the

feed mechanism. A dial on the front of the case provides a visual means of checking the operation of the machine. The Van Norman electric gauge automatically sizes and disengages the wheel when the work has been ground to size.

The No. 72 Van Norman Oscillating Grinder is the latest result of research in the field of intensive grinding of small rings. The machine is similar in design to the Van Norman No. 33A Oscillating Grinder, but this machine is equipped with an electric gauge unit which assures desired accuracy and automatic cycling.

On the No. 72 Machine, the work to be ground is loaded into the work-holding device and the electric gauge placed in position. When the gauge registers a diameter in the ball race approximately 0.002 inch from the finish size, the flow of water to the ring is shut off. Dry grinding is then used until the ring is ground to final size, when the electric gauge automatically stops the feed.

The features contained in previous Van Norman machines are adapted to this grinder. The wheel head is driven direct from a motor mounted on a wheel shaft at the rear of the spindle. The machine is full ball-bearing construction throughout; compact, rigid, and vibrationless in design.

## Landis Tool Company

Waynesboro, Pa.

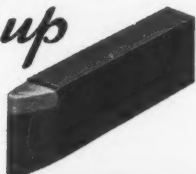
### Booths No. J. and K, Arcade

This exhibit will consist of Landis 16x42-in. Type D Hydraulic Crank Pin Grinder tooled to grind crank pins of a well-known automobile crankshaft; a 5x40-in. Type D Hydraulic Crank Grinder tooled to grind the contour of a typical camshaft; a 10x36-in. Type Semi-Automatic Hydraulic Crank Grinder tooled to grind the three main bearings of a well-known camshaft and equipped with three separate Landis-Solex Sizing Devices; a 16x18-in. Type C Plain Hydraulic Grinder arranged so as to demonstrate dramatically how the Landis-Solex Sizing Device functions; a 14x48-in. Type D Plain Hydraulic Grinder set to grind a roll and equipped with roll heads; a 3½-in. Hydraulic Internal Race Grinder and a 5-in. Hydraulic Race Grinder. The machines to be in operation on grinding of races and equipped with Landis-Solex Sizing Devices; a 16x42-in. Type C Hydraulic Internal Race Grinder tooled to grind the bore of a ball

August, 1935

# BIGGER AND BETTER MACHINE TOOLS

*are worth while only when  
cutting edges stand up*



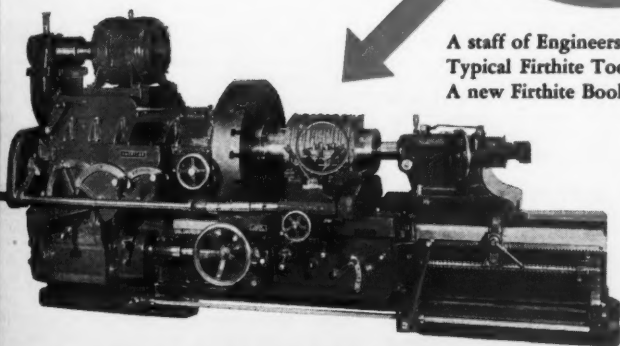
Leading Machine Tool Builders have designed new machines specially to use Sintered Tungsten Carbide.

We invite you to Booth No. A-206 at Cleveland to discuss the use of Firthite Sintered Carbide in both new and old machines.

**A FEW GRAMS  
OF FIRTHITE  
CAN DOUBLE THE  
RETURNS ON YOUR  
INVESTMENT**

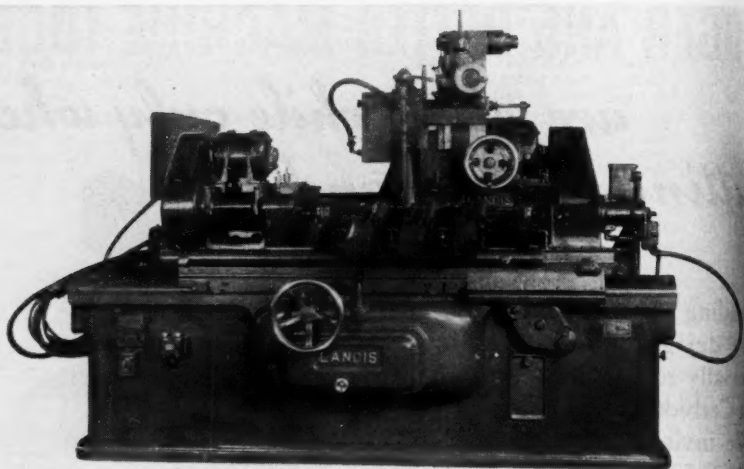


A staff of Engineers are at your service.  
Typical Firthite Tools will be displayed  
A new Firthite Booklet ready for you.



## FIRTH-STERLING STEEL COMPANY

Worke, McKEESPORT, PA.  
NEW YORK CHICAGO  
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GLOBE WIRE DIVISION  
McKEESPORT, PA.



Landis 10-in. Type C Semi-Automatic Hydraulic Grinder

and equipped with a Landis-Solex Sizing Device; a 14x36-in. Type C Hydraulic Universal Grinder, and a 12x32-in. Tool and Cutter Grinder set up with standard equipment.

The 10x36-in. Type C Semi-Automatic Hydraulic Grinder and the 5x40-in. Type D Hydraulic Cam Grinder are new machines. The former machine is especially recommended for the grinding of multi-diameter shafts, due to the fact that this machine is arranged for semi-automatic operation and is therefore economical. Varying diameters of the same shaft may be ground with but one set-up and with no loss of time. The machine shown is tooled to grind all five main bearings of a well known cam shaft.

To operate, the shaft is placed on the work cradle of the machine and the main control lever is moved to start the machine. The footstock center advances and picks up the work, which starts rotating. While this is taking place, the wheel feeds in rapidly. The work-rest jaws also move into operative positions. As the wheel is about to come into contact with the work, the feeding in movement slows down to the predetermined grinding feed. When the bearing is ground to within 0.002 in. of size the sizing device functions, causing the feeding in movement to further slow down. When exact size is reached, the sizing device again comes into play and

causes the wheel base to move back to its starting position rapidly.

After the base has reached its starting position the table traverses, bringing the next bearing on the shaft to a position in front of the grinding wheel. At the same time the sizing head to be used in connection with the bearing about to be ground moves into operative position. From this point on the grinding proceeds in the manner just described for each successive bearing. When the last bearing is ground, the base moves back to its starting position.

It can readily be seen that no time is lost positioning the table for each diameter and it is also evident that the operator may easily operate a semi-automatic machine.

The standard 10-in. Type C Plain Hydraulic Bed is used, also a standard head stock. The footstock spindle is hydraulically operated. Basically, the wheel base is standard with the V-belt spindle drive through multiple V-belt babbitt-lined steel wheel spindle bearings. Bearings and spindle are continuously lubricated with filtered oil. The hydraulic straight infeed mechanism of the standard Type C excepting that on this machine it is actuated by means of a solenoid instead of the usual hand lever.

On the machine illustrated, five bearings are mounted on the table between the workheads, the center three only be-

NORMA

# NORMA-HOFFMANN

## PRECISION BEARINGS

### For PRODUCTION AT LOWER COST

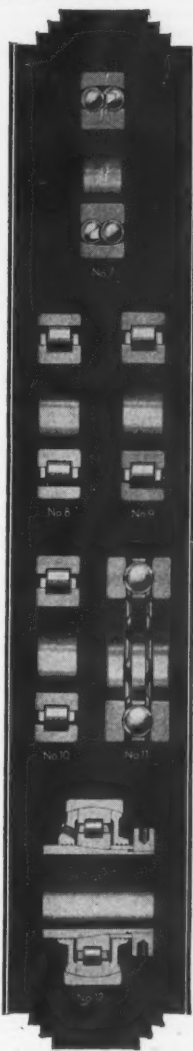
**T**HIS is the objective of every executive, engineer and designer; and the performance of the bearings in a production machine is a vital factor in keeping costs down. \* \* \* \* But, in comparing bearings, look beyond first cost—look to the ultimate cost over a period of years. Let proved performance point the way to your decision. \* \* \* \* For almost 25 years, in every field of industry, Norma-Hoffmann **PRECISION** Bearings have been making distinguished records which command the confidence of those who seek the lower production costs that come with the use of better bearings.

### PRECISION BEARINGS

For Every Load, Speed, Duty

**N**O ONE type of bearing is so versatile in its operating characteristics that it will meet all conditions; the conditions should determine the type of bearing used. From the comprehensive **NORMA-HOFFMANN** line—here illustrated in part and briefly indexed—a **PRECISION** Bearing, or several in combination, can be chosen that will be exactly right for the duty. Let our engineers, with their specialized experience, work with you in selecting and applying bearings that will lower your production costs. Write for the Catalog.

- 1—Open (separable) type ball bearing.
- 2—Closed radial type ball bearing.
- 3—Angular contact ball bearing.
- 4—Plate (shielded) type ball bearing; available both with one and two grease-retaining, dirt-excluding side plates.
- 5—"GreaSeal" felt-protected ball bearing with single removable felt seal; available also with single felt seal and plate shield, fully enclosed.
- 6—"GreaSeal" double felt-protected ball bearing, fully enclosed, with double removable felt seal to exclude dirt and retain lubricant.
- 7—Double-row, self-aligning ball bearing; also furnished with adapter sleeve and nut.
- 8—Standard cylindrical roller bearing.
- 9—One-lipped cylindrical roller bearing.
- 10—Two-lipped cylindrical roller bearing; available also in "full" (cageless) type with retaining rings.
- 11—Ball thrust bearing.
- 12—Self-aligning adapter type cylindrical roller bearing, wholly enclosed to exclude dirt and retain lubricant.



**NORMA-HOFFMANN BEARINGS CORP. N. - Stamford, Conn., U.S.A.**  
Booth No. A-401, National Machine Tool Exposition.



used for workrests. Parts with a different number of diameters would require a different number of bases, the number of workrests being determined by the length and characteristics of the work. Hydraulic power actuates both the workrest shoes and the sizing heads. Brackets attached to the two end bases serve as the work cradle.

The Landis-Solex Sizing Device used is both automatic in operation and consistently accurate; thus it permits the full productive possibilities of the machine to be utilized, at the same time maintaining close limits of accuracy. The principle of the device involves the use of air to provide pressure which controls the level of mercury in a mercury switch. An air outlet is provided which decreases in size as the sizing head moves forward in the process of grinding. As finish size is reached the outlet is closed, the mercury rises until it touches a contact point, and an electric circuit is completed which energizes a solenoid and the wheel moves away from the work.

The 10x36-in. Type C Semi-Automatic Hydraulic Grinder weighs, complete with all tooling and electrical equipment, 12,500 lbs. Three electric motors are used, all of the constant speed type.

### Gisholt Machine Company

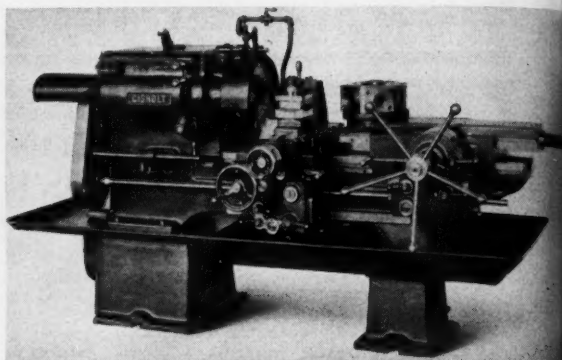
Madison, Wisconsin

Booth No. 112, North Annex

The exhibit at this booth will include the following machines, in operation on typical work:

Gisholt No. 3 Universal Turret Lathe; Gisholt No. 4 Turret Lathe; Gisholt No. 5 Universal Turret Lathe; Gisholt 1L Turret Lathe; Gisholt 2L Turret Lathe; Gisholt 3AL Turret Lathe; Gisholt 4L Turret Lathe; Gisholt Simplimatic; Gisholt Universal Tool Grinder; Gisholt Dynamic and Static Balancers; Accessory tools for Gisholt Turret Lathes.

Included in the exhibit will be the new Gisholt No. 3 Turret Lathe which is now available in both plain and



"Gisholt" No. 3 Turret Lathe

universal models. Designed for manipulation on light work, yet retaining the power and rigidity for heavy work up to its capacity, the lathe has a capacity of 1½ in. diameter by 10 in. length and a chucking capacity of 1½ in. swing over the cross slide or 18 in. over the ways.

Hardened alloy steel gears in the stock provide six spindle speeds and reverse, which may be obtained in a normal speed range of 65 to 730 rpm for general purpose work or with a high or lower range for specific needs. The six speeds are grouped in two groups of three and three low speeds. Instant shifting from one group to the other without stopping the spindle is possible.

The cross slide will handle cross feeds for any work within the range of the machine. In the universal model, the cross slide has eight power feeds, in cross and longitudinal, and reverse in both directions. Apron shafts are mounted in ball bearings and the apron gear train runs in an oil bath. The "Gisholt" square turret tool holder is applied to the universal cross slide.

Motor drive is generally of the cast multiple V-belt type, although a vertical base motor mounting and also flat belt and chain drives as well as a countershaft drive may be used.

### Lehmann Machine Company

St. Louis, Mo.

Booth No. 312, North Annex

Included in this exhibit is a new machine that has recently been developed—the "Hydratrol" Lathe. The machine is hydraulically operated and the



# he dictates Wire Specifications



for Millions per hour

The inherent stiffness of steel wire makes it the logical material from which to fabricate pins. Now that science can control its uniformity, it is worked in extremely high speed machines. Wire is first straightened as it enters the machine. A tiny hammer forces the end into a die, forming the head. Discharged, the wire moves forward and is cut to size. Then it moves against an abrasive wheel and the point appears. Wire is now a pin ready for plating... made at the rate of millions per hour. The fact that Wick-

wire Spencer is able to satisfy the dictates of a pin manufacturer so painstakingly precise as William Prym of America, pioneer of the world-famous triple-plated Sonamor steel pins, is certainly indicative of their ability to give you the wire you want.



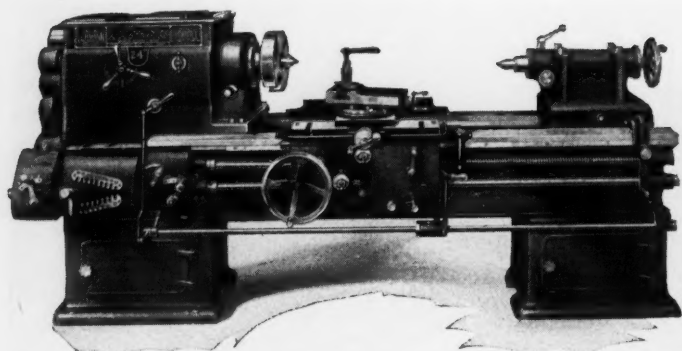
**WICKWIRE SPENCER STEEL CO.**  
New York City, Buffalo, Chicago,  
Worcester; *Pacific Coast Headquarters:* San Francisco; *Warehouses:* Los Angeles, Seattle, Portland. *Export Sales Department:* New York City.

## WISCO WIRE

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Wickwire Spencer manufactures High and Low Carbon Wires—various tempers, grades and finishes—for your specific purpose. Hard-Drawn, soft or annealed Basic or Bessemer Wires—Hard-Drawn annealed, or oil-tempered Spring Wire, Chrome Medium Spring Wire—Valve Spring—Music—Clip—Pin—Spring—Hook and Eye—Broom—Stapling—Bookbinding—

Machinery Spring Wire—Reed Wire—Clock—Pinion—Needle—Bar—Screw Stock—Armature Binding—Brush—Card—Florist—Mattress—Shaped—Rope—Welding. Flat Wire and Strip Steel, High or Low Carbon—Hard, annealed or tempered—Clock Spring Steel—Corrosion and Heat Resisting Wires. Consult the Wisco technical man on your wire problem, however large or small.



Lehmann  
Machine  
Company's  
Hydraulic  
Lathe

of the head is such that when the proper cutting speed is selected, the correct spindle speed is automatically obtained. To assist the operator, an automatic slide rule is provided which gives both the spindle speeds and cutting speeds in feet per minute. The machine is built in sizes from 16 in. to 24 inches.

The pulley drive shaft carries three hydraulically-operated friction clutches. One of these clutches provides eight reverse speeds and the other two provide the initial speed progression for the sixteen forward speeds, selectively functioning through the selector valve and operatively through the control valve. The clutches require no adjustment providing capacity of 25 h.p. on the 16-in. and 18-in. lathes and 40 h.p. on the 22-in. and 24-in. sizes.

Speed changes are effected by turning a three-lever handle at the front of the head stock. The handle may be turned without intermediate stop to any speed desired and the speed change made without disengaging the friction driving clutch. Coordinating with the movement of the handle is the automatic slide rule which shows the spindle r.p.m. and the cutting speed in feet per minute. Calculation by the operator is unnecessary. The speed change handle is moved until the diameter of the work registers with the specified cutting speed and the spindle is automatically set for the correct revolutions per minute.

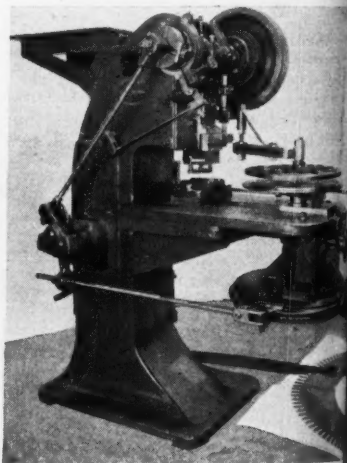
Spindle release for chucking is obtained by turning a small T-handle at the front end of the head stock. Movement of this handle disengages the positive clutch and brake on the spindle so that it may easily be turned by hand. The lathe has a normal range of 16 spindle speeds with 56 thread and feed changes on the 16 and 18 in. sizes and 63 feed changes on the 22 and 24 in. sizes.

The Lehmann Machine Company also exhibiting a 16-inch Geared Tool Room Lathe with sixteen speeds obtainable through forward and reverse clutches that are controlled from the apron and head stock. The machine is powered by a motor in the leg. The attachment, draw-in chuck, and oil are standard equipment.

### The V & O Press Company

Hudson, N. Y.

Booth No. E-315, Exhibition Hall



V & O No. 410 High Speed Notching Press

This exhibit consists of a V & O High Speed Press for notching laminated Standard Inclinable-Type Press

The extra supply of production delay information. powered pr

# MORE THAN 80 MACHINE TOOL BUILDERS

## INSTALL RUTHMAN GUSHER PUMPS ON ORIGINAL EQUIPMENT

● Eliminating foot valves, relief valves and packing nuts, simple Ruthman Pump designs have found wide favor. For proof, see the many outstanding tools at the Machine Tool Show which are Ruthman-equipped!

Ruthman designs cut costs at the same time they minimize trouble, by eliminating unnecessary parts. Specialists in the building of coolant pumps ONLY, Ruthman is equipped to fill your order quickly, economically and with more than the usual satisfaction.

## THE RUTHMAN MACHINERY CO.

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Cincinnati, Ohio



Outside mounted type.  
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**GUSHER COOLANT  
PUMP**

The extra volume and dependable supply of coolant will speed up your production and save many tool grinding delays. Write for further information. Your inquiries will be answered promptly.

with rollfeed, scrap cutter, stock wheel, dies and so on and a demonstration board showing work samples.

The V & O No. 410 High Speed Notching Press is of the pedestal type. Journal bearings are of overhanging construction, carrying the thrust directly into the body proper. An eccentric throw in the shaft affords rigidity, together with a large bearing surface.

A multiple disc friction clutch is employed, eliminating shocks from engagement at high speeds. It also makes all parts integral, eliminating back lash. The brake is engaged only when the clutch is released. The fly wheel is of web type.

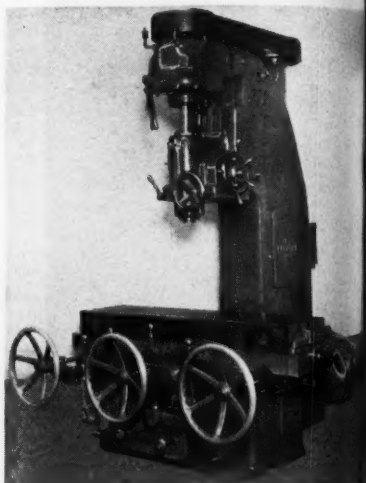
The discs are carried on a friction-driven positive locking indexing mechanism, which is adjustable in and out for various diameters of laminations by means of a lead screw having a micrometer dial. The spindle of this mechanism is mounted on Timken roller bearings. Index rings are of large diameter, assuring accurate spacing. The index pawl can be adjusted to secure relation between the key way and the notches.

The machine will notch laminations from 3 in. to 20 in. diameter, with a maximum of 120 notches. It is designed to operate at speeds up to 650 strokes per minute, and will be equipped with a new departure variable speed transmission. Either a rotor or stator fixture can be applied.

## Reed-Prentice Corporation Worcester, Mass.

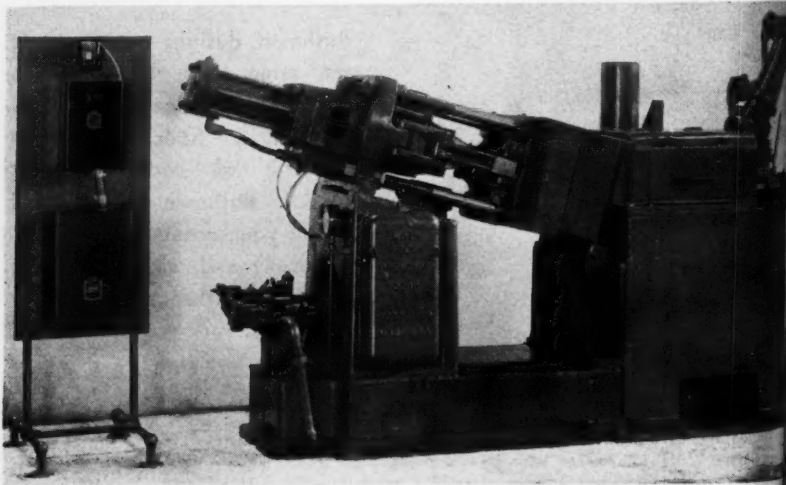
Booth No. C, Arcade

The Reed-Prentice exhibit consists of



No. 4 Vertical Miller and Die Sinker

Reed Prentice Full Hydraulic Die-Casting Machine, No. 2V Router and Vertical

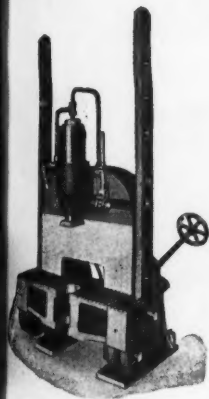


Reed-Prentice Full Hydraulic Die Casting Machine

The machine converts iron to a high quality of a h... the ass... backs. '... can be... standar... num o... handlin... ion. T... lower p... ou to... here.

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# The PRESS with a HUNDRED USES

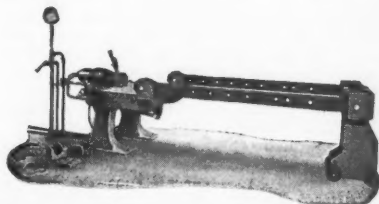


## THE WATSON-STILLMAN VERTICAL HORIZONTAL ● PRESS ●

A New Hydraulic Press for general shop use; a press that can be used in vertical or horizontal position; a composite unit of 60-tons capacity embodying:—

- A Pipe Bender
- A Shaft Straightener
- A Die Sinking and Upsetting Press
- A Vertical Forcing Press
- A 7-Ft. Horizontal Forcing Press
- A Horizontal Forming and Bending Press

The machine can be easily converted from one position to the other by means of a hand wheel, without the assistance of crane or jacks. The abutment beam can be moved out (in the standard press) a maximum of 7-ft. A four-wheel truck is provided to permit easy handling and also to support the beam when in the extended position. The press can be operated by a hand pump or by a small power pump. You will find it a time and labor saving tool enabling you to do work in your own shop which you now have done elsewhere. Send for Bulletin B-22.



## The WATSON - STILLMAN Co.

HYDRAULIC MACHINERY ● VALVES ● FITTINGS

FIRST AVENUE WEST, ROSELLE, N. J.

Milling Machine, No. 3V Vertical Milling and Die-Sinking Machine, No. 5 Vertical Miller and Die Sinker, and Reed-Prentice 14-in.x6-ft. Sliding Gear Head Motor-Driven Engine Lathe.

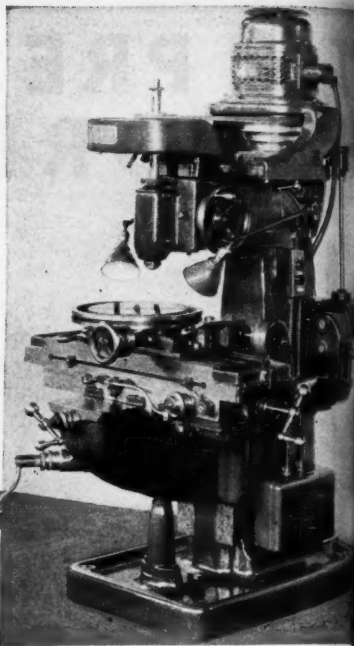
The No. 1 Full Hydraulic Die-Casting Machine is of the full automatic type with electric timing mechanism which allows the operator to set the machine for any pre-determined period for solidifying of castings from 0 to 20 seconds. The machine can be arranged for either automatic or manual operation. The electric safety mechanism makes it impossible to shoot the metal until the dies are closed and securely locked, precluding the possibility of injury to machine or operator.

The capacity of the melting pot for zinc is 500 pounds.

The maximum die space is 12 in. and the minimum die space is 4 in. The die opens 8 in. Locking pressure of the cylinder is 44 tons. The motor is 5 h.p. and provides 24 gal. per minute at 300 pounds. The time required to close dies is one second; plunger diameter 2½ in.; plunger stroke, 6 in.; estimated shots per hour, 600, and time per cycle 6 seconds. Oil pressure is 1,000 lb. per square inch.

The No. 2V Router and Vertical Milling Machine is of heavy construction, the motor bracket and spindle mounting being so designed as to eliminate vibration. The working surface of the machine table is 18 in. x 8½ in., and the length of the carriage is 16½ in. The maximum distance between the spindle and machine table is 17 in. and the maximum distance between the spindle and frame is 15 inches.

The machine has a longitudinal feed of 14 in., cross feed of 11 in., and vertical feed of knee of 15 in. There are 10 spindle speeds ranging from 1000 to

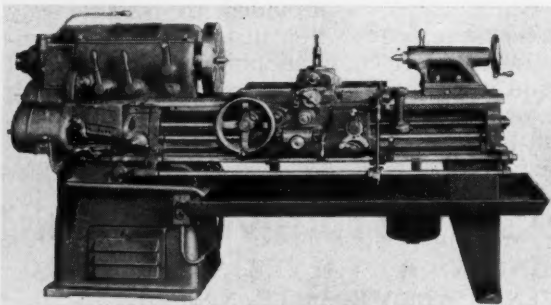


Reed-Prentice No. 3V Vertical Milling and Die Sinking Machine

6000 r.p.m. with an 1800-r.p.m. motor, 666 to 4000 r.p.m. with a 1200-r.p.m. motor, 500 to 3000 r.p.m. with a 900-r.p.m. motor, or 2000 to 12000 r.p.m. with a 3600-r.p.m. motor. The floor space required is 40x34 inches.

The No. 3V Vertical Milling and Die Sinking Machine is powered with a vertical motor drive like the smaller 2V model. It is through an end V-belt and 4-step pulley and motor pulleys providing 10 spindle speeds. Six feeds are available for each spindle feed, the feed being taken from the motor through helical gears and a vertical shaft to the table box.

The working surface of the machine table is 10¼x30¾ in., and the length of the carriage is 31¾ in. The machine



Reed-Prentice 14-In. x 6 Ft. Sliding Gear Head Motor-Driven Engine Lathe



# Here is a NEW, EASIER, SAFER WAY to get BETTER TOOLS!

The Carpenter Tool Steel Selector—  
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distance between the spindle and the machine table is 16½ in. and the maximum distance between the spindle and the frame is 16 in. The longitudinal feed is 21 in., cross feed is 12 in., and the vertical feed of the knee is 16½ in.

The range of spindle speeds is 600 to 4000, 395 to 2630, or 295 to 1950, depending on the speed of the motor. Floor space required is 60x68 inches.

The No. 5 Reed-Prentice Vertical Miller and Die Sinker is shown equipped with a heavy die sinker's table. The table is of heavy design, and is said to withstand the most severe duty. The specifications for the machine are: longitudinal power feed, 8 in.; cross power feed, 16 in.; vertical feed of spindle, 9 in.; max. distance spindle to table, 20 in.; throat depth, 20 in. Rapid power traverse in either direction of 100 in. per min. Working surface of table 68x16 inches.

There are 18 spindle speeds, ranging from 17 to 600 r.p.m., with 8 feeds for each spindle speed. Net weight, 10,500 pounds.

The Reed-Prentice Sliding Gear Head Engine Lathe has a 20-in. swing and is especially designed for precision work. The quick-change gear mechanism provides 49 thread and feed changes, making available threads from 1½ to 96, and feeds from 0.0035 to 0.224 in. per revolution.

### Abrasive Machine Tool Company

East Providence, Rhode Island

Booth No. 405, North Annex

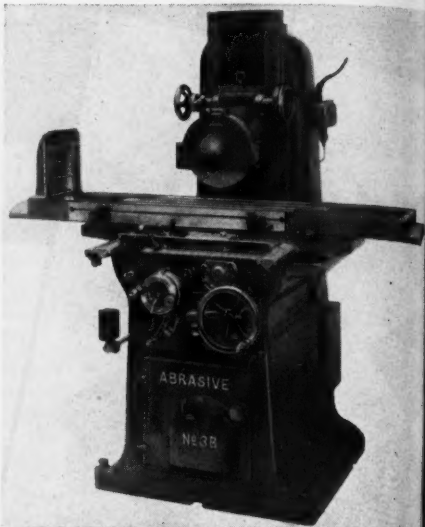
Included in this exhibit are the following machines:

No. 1½ Abrasive Hand Feed Surface Grinder, Motor Driven; No. 3B Abrasive Motor Driven Surface Grinder with Automatic Feeds; No. 33 Abrasive Vertical Spindle Motor Driven Surface Grinder with Automatic Feeds; Graham Type 12 in. Face Grinder with Hand Feeds; Motorized Dust Exhaust Attachment.

The No. 3B Surface Grinder included in this exhibit has recently been brought out by the Abrasive Machine Tool Company. It is of the horizontal type with a reciprocating table. It has capacity longitudinally of 24 in., transverse, 8 in., and vertical, 12 in. The working surface of the table is 24x8 inches.

The spindle is of chrome steel, hardened, ground and lapped. It is carried

in a phosphor bronze box at the front and super-precision ball bearings at the rear, the whole assembly being mounted in a removable cartridge tight housing.



Abrasive No. 3B Motor Driven Surface Grinder

The spindle is driven by an endless belt at a normal speed of 2290 r.p.m. Table speeds of 20 ft. and 40 ft. per minute are available, the speed change being accomplished with a push-pull knob on the gear box. Feeds in both directions are automatic. Wheels are standard, type 1, face A, 10-in. diameter by ¾-in. thick by 3-in. hole. Large diameters are available upon order.

The machine is driven either by counter shaft or by 3-h.p., 1750-r.p.m. motor. The motor is controlled by means of a magnetic starter with push button, and is direct connected to the main drive shaft through a flexible coupling. Blowing dust exhaust attachment or wet grinding attachments are available for use with this machine. Floor space required 48x92 in. Weight, net, 2450 pounds.

### Buffalo Forge Company

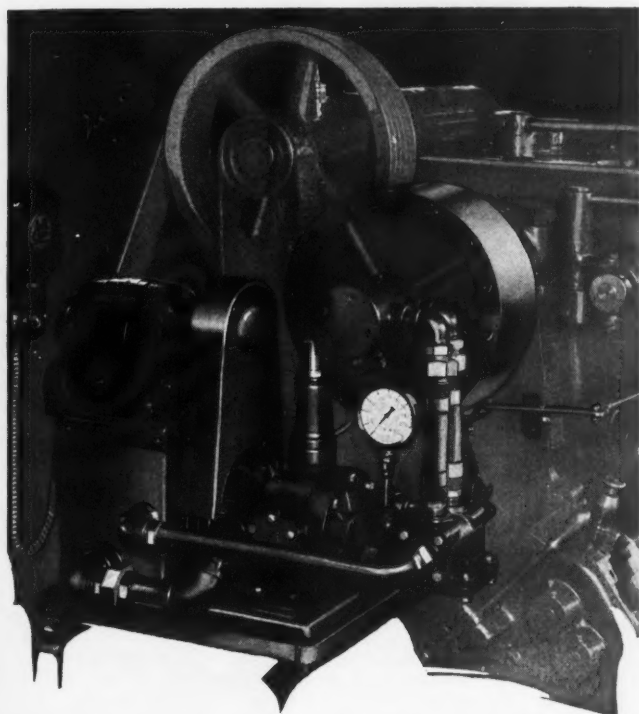
Buffalo, N. Y.

Booth No. 111, North Annex

Among the machines shown at the Buffalo Forge Company's Booth will

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## ●ELECTRIC-HYDRAULIC CHUCK OPERATING UNIT . . . . .

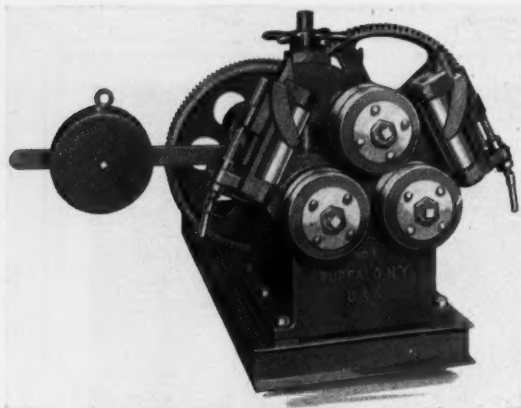
Designed and built for use on machines which necessitate a single unit chuck-operating mechanism, this unit becomes an outstanding, efficiency increasing feature of the machine. The compactness of its construction, the ease with which it is mounted on the machine, and its capacity of working pressures up to 250 lbs. per square inch make this unit a "sure" bet which simply should not be overlooked. Write for further information, investigate its advantages, install one and let it prove itself. And then too—

**HOPKINS HYDRAULIC ROTATING CYLINDERS**  
are standard equipment on these units.

**THE TOMKINS-JOHNSON CO.**

620 N. Mechanic Street

JACKSON, MICHIGAN



**Buffalo No. 1 Bending Roll**

the No. 1 Bending Roll illustrated above. This machine is of the single housing type with overhanging rolls, making the removal of finished circles possible without necessity of dropping one housing.

The frame is self-contained, the construction being such that it does not depend on the sub-base to keep the front and rear bearings on the roll shafts in alignment. The lower rolls are placed at close centers, resulting in a minimum of straight ends on finished circles. Guide rolls are adjustable in the plane of the material being bent in accordance with the diameters, and can be moved in or out to counteract any twisting tendency of unsymmetrical sections. The No. 1 Bending Roll is fully bronze-bushed and is equipped with Alemite oiling system, with fittings conveniently located.

## Kent-Owens Machine Company

Toledo, Ohio

Booth No. 105, North Annex

The Kent-Owens exhibit will include the following machines:

No. 2 Standard Heavy Duty Milling Machine; No. 26 Automatic Cam Controlled Table Machine; No. 2 CF Cam Controlled Head Machine; No. 3 RQ Milling Machine.

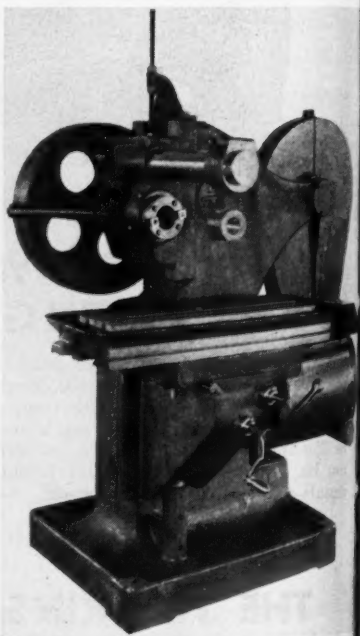
Several new features are incorporated in the design of the No. 26 Milling Machine, which has just been announced. The table feed of this machine is cam controlled, permitting any desired cycle of automatic table movement. It is

applicable especially to high production jobs or long runs where maximum economy is required.

A cushioned belt drive to the spindle assures smooth cutting with an absence of back lash. Standard equipment permits spindle speeds to 2000 r.p.m., although higher speeds can be provided. Pick-off gears in the table feed train readily permit changing the cam drive speed. Cam drive gear, cam, and clutch operate in an oil bath. The cam housing is integral with the saddle and mounted on the knee.

The usefulness of the machine is broadened by its adaptability for special automatic fixtures and special cutter arrangements.

table working surface of 36x8 $\frac{1}{4}$  in. with three T-slots permits the mounting of two fixtures, one of which can be loaded



**Kent-Owens No. 26 Milling Machine**



*You*

*are cordially invited*

*to visit*

*Modern Machine Shop*

*Booth No. A-8*

*at the*

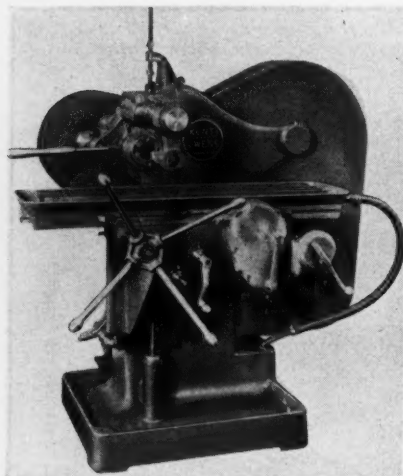
*Machine Tool Show*

*Cleveland, Ohio*

*September 11-21*

*1935*





Kent-Owens No. 3 RQ Milling Machine

while the other is in process. A multiple plate clutch assures smooth engagement and instantaneous release. All slides are of nickel alloy, providing maximum accuracy, smooth travel, and long life. Typical of all Kent-Owens Millers, the spindle and back shaft are mounted on tapers.

The outstanding feature of the No. 3 RQ Milling Machine consists in that feed changes can be made by the operator by movement of a handle at the front of the machine within convenient reach. The operator can vary the feed while the machine is in operation if necessary, thereby obtaining the maximum efficiency of the cutter.

The column, knee, cross slide, and table are extra rigid to insure accuracy. The table has a working surface  $36 \times 8\frac{1}{4}$  in. with  $3\frac{1}{2}$  in. T-slots. A continuous range of spindle speeds from 42 to 1200 r.p.m. is available with a 1200-r.p.m. motor. The range of the table feed by power or with a star hand wheel is 23 in. Vertical feed of the head with hand lever is  $6\frac{1}{2}$  in. Cross adjustment of saddle, 7 inches.

The spindle pulley is of the heavy balanced fly wheel type to eliminate chatter, increase the cutter life and reduce

maintenance costs. The net weight of the machine is 3025 lbs.

## Potter & Johnston Machine Company

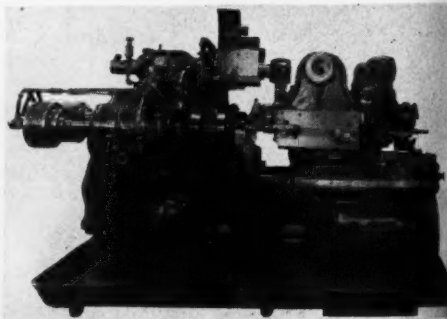
Pawtucket, Rhode Island

Booth No. 602, North Annex

Included in this exhibit will be a new P & J Model 5-D-2 Spindle "Power-Flex" Automatic Chucking Machine and a P & J No. 7-D Manufacturing Automatic Chucking and Turning Machine.

The "Power-Flex" 5-D-2 Spindle Automatic Chucking Machine is designed to provide maximum flexibility and great productive capacity. Unit construction is employed throughout. The base is of exceptionally heavy box section with hardened and ground steel ways. There are solid blocks of steel tongues to the base bolted in position and ground in place. The spindles are of high carbon forgings, mounted in oversize anti-friction bearings. All headstock gears are of chrome metal steel spiral form teeth, heat treated and running in a circulating oil bath. All shafts are of alloy steel, heat treated, and mounted on Timken roller bearings.

Twenty-eight changes of speed between 19 and 613 r.p.m., arranged in seven sets of four automatic changes are available. Any group of four automatic changes may be quickly obtained by application of the proper set of back pick-off gears. There are 24 feeds arranged in geometric progression. Feed boxes can be supplied to provide a range of from 0.0057 to 0.125 in. per spindle revolution or from 0.0057 to 0.062 in. per spindle revolution. There are three



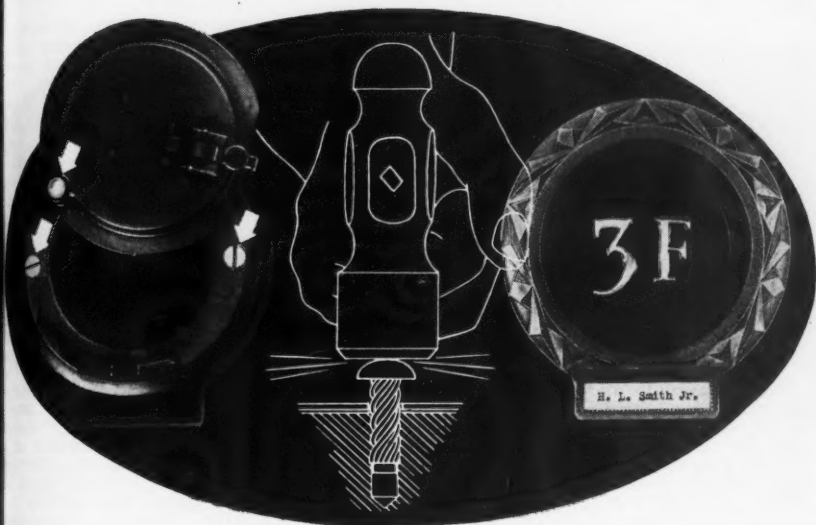
P & J "Power-Flex" Model 5-D-2 Spindle Automatic Chucking and Turning Machine

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# Through this "Peep-Hole".



—get a view of the mass production economy available  
to makers of small volume items

EVEN if George W. Ackerman, Inc., made this Door Inter-viewer in lots of a million instead of a thousand, assembly could not be more economical. It is now done with the highest efficiency . . . by the same simple method employed in huge plants that turn out automobiles, radios and a host of other products on a mass production basis.

To fasten the cover to the casting, a Hardened Metallic Drive Screw is used instead of a machine screw. "Notable savings of time

and labor through elimination of the tapped hole became apparent in the first thousand put through," says Ackerman. "And we have a superior attachment which does not loosen and cannot be removed."

Fine results with the cover assembly led to adoption of Type "Z" Hardened Self-tapping Sheet Metal Screws to replace machine screws for assembling two die cast parts of the frame. This has brought an added saving, as the tapping in shallow bottomed holes was especially difficult and costly.

Simplicity of use makes these unique Screws equally adaptable to small or large volume production, and affords identical unit savings to the maker of an auto and the maker of a "peep-hole" or a mechanical pencil. A hammer drives the Hardened Metallic Drive Screw into a plain hole . . . a screwdriver, plain or automatic, turns in the other types of Self-tapping Screws. They form a thread in the material as they go in.

Consider your assemblies . . . send brief descriptions of them for recommendations and free samples for a trial.

PARKER-KALON CORPORATION  
Dept. M., 198 Varick St. New York

## PARKER-KALON TYPE "U" HARDENED METALLIC DRIVE SCREWS

PATENTED NO. 1,981,191—NO. 1,918,322—NO. 1,978,145—NO. 1,978,330

TRY THESE, TOO

### Type "T" Hardened Self-tapping Sheet Metal Screws

For joining and making fastenings to sheet metal up to six gauge also aluminum, die castings, Bakelite, etc. Simply turn Screw into drilled, pierced or molded hole. It forms a thread in the material as it is turned in. Can be removed and replaced.

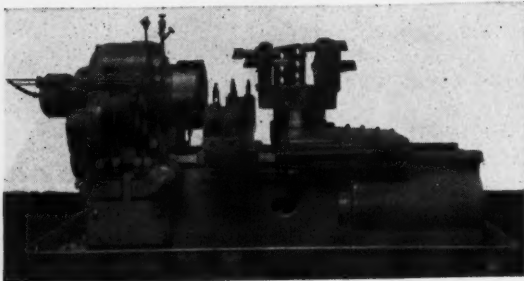
### Hex Head Hardened Self-tapping Cap Screws

For making fastenings to sheet metal from 14 gauge to 10 gauge, and also to steel plates and structural shapes up to 1/4 inch thick, solid brass, bronze, die castings, etc. They function like the Type "Z" Screws but are driven with a wrench.

Parker-Kalon Products are sold only through recognized distributors



automatic changes of speed, any one of which may be selected by the application of proper pick-off gears on the ends of the feed box unit. All gearing within the feed box unit is of alloy steel and runs in oil.



P & J Model 7-D Manufacturing Automatic

The cross slide and base are of new design. The cross slide cam drum is located directly under the cross slide and the ball bearing cam roll studs are mounted in the cross slide, thus furnishing a direct connection. The "Power-Flex" 5-D-2 Spindle Automatic is provided with power operated automatic clutches under dog or hand control. All changes of speed and feed may readily be accomplished while the machine is cutting. The clutches are engaged and disengaged by power.

The distance between spindles, center to center, is  $15\frac{1}{2}$  in. Swing over cross slide,  $15\frac{1}{2}$  in. Total turret slide travel,  $11\frac{1}{2}$  in. Turret feed, 11 in. Net weight, 14,000 pounds.

The Potter & Johnston 7-D Automatic is one of the latest developments in the P & J line of manufacturing automatics. The base is of exceptionally heavy box section, and is provided with hardened and ground steel ways of liberal dimensions, anchored and ground in place. The spindle is of high carbon steel forging and is mounted on oversize anti-friction bearings. Head stock gears are of chrome nickel steel with spiral teeth, heat treated and running in oil.

There are 20 changes of speed, between 11 and 248 r.p.m. Changes may be made by means of hand levers on the front of the machine, or automatically by means of dogs. The feed gears are driven from the spindle, 24 feeds in geometric progression from 0.007 to 0.250 in. per spindle revolution. These feeds are in three groups; i.e., coarse, medium and fine. Any one of these groups may be brought into operation automatically by

means of the feed dog or hand lever. The cross slide, turret and turret slide mechanisms are practically the same in design as those in use in the Model 5-D-2 Spindle "Power-Flex" Manufacturing Automatic.

Swing over the bed is 36 in.; swing over cross slide is 23 in. Travel of cross slide each way,  $8\frac{1}{2}$  in. Total turret slide travel, 28 in. Turret feed, 13 in. Net weight, 14,500 pounds.

### United States Electric Tool Co.

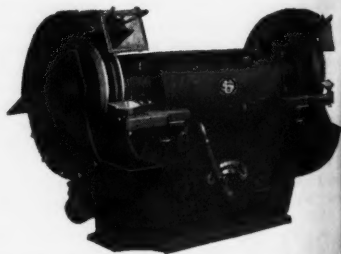
Cincinnati, Ohio

Booth No. 102, North Annex

This company's exhibit includes a new Adjustable Speed Alternating Current Grinder, to be known as the Model 65. The grinder is

equipped with a patented gear drive transmission with which four wheel speeds are instantly available. Gears are shifted by a hand lever located in convenient position. Thus the operator can change the wheel surface speed as the wheel wears down, maintaining the highest grinding efficiency, minimum replacement cost of wheels, and the maximum of production.

A wheel speed of approximately 5,500 surface speed per minute with vitrified wheels and 9,500 with high speed wheels can be maintained. The gear drive transmission which makes this possible also shows the maximum power transmission efficiency. The drive is positive



"U. S." Model 65 Adjustable Speed Alternating Current Grinder

in action, quiet, durable, and low replacement cost.

The machine is available in 3 to 12-inch to 15 h.p., 30-inch sizes.

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# WHERE ACCURACY IS DEMANDED . . . W.T.T. Co. DIAMOND POINTED TOOLS ARE USED!

For fine, precision work . . . coupled with efficient and economical operation, there is no substitute for quality diamond pointed tools! Foremost users of Industrial diamond tools have been using W. T. T. Co. products for 25 years.

Every precaution is taken to supply our customers with precision-built tools! As an example, we use regularly a Jones & Lamson Comparator for inspecting all of our diamonds.

W. T. T. Co. Diamond Tools are used for dressing wheels on Norton, Landis, Brown & Sharpe, Heald, Cincinnati Centerless and Centertype—and numerous other grinders used in production and tool room work! Our Diamond Boring Tools are being used successfully on Excello, Heald, Cimatool, Coulter and many other machines of special design.



Get acquainted with our diversified line of Diamond Pointed Tools, a few of which are shown here! Write for detailed information and prices!

## WHEEL TRUEING TOOL COMPANY, Inc.

13931 OAKLAND AVENUE

DETROIT, MICHIGAN

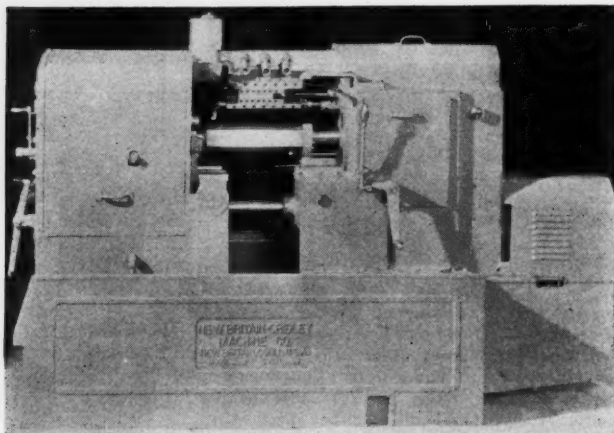
BRANCH OFFICES: Indianapolis, Chicago, Rochester, Pasadena, Philadelphia, Atlanta and Windsor, Canada.

## The New Britain-Gridley Machine Company

New Britain, Conn.

Booth No. 909, North Annex

The feature of the New Britain exhibit will be a new line of New Britain Automatic Screw Machines which are built in four models, known as Model



New Britain Model 40 Automatic Screw Machine

40, 41, 60, and 61. The Models 40 and 41 are of the four-spindle type. The Model 40 machine is built in two sizes,  $\frac{7}{8}$  in. and 1x5 in. and the Model 41 is built in several sizes ranging from  $1\frac{3}{8}$ x6 in. up to and including  $2\frac{1}{4}$ x6 in. The Models 60 and 61 are six-spindle machines. The Model 60 is built in two sizes,  $\frac{7}{8}$  in. and 1x5 in., and the Model 61 is built in sizes up to and including  $2\frac{1}{4}$ x6 in.

The fundamental aim of the engineers in designing these machines was to combine high speed and rigidity with accuracy. Spindles are mounted on pre-loaded ball-bearings, preventing radio or axial deflection under heavy cuts. Spindles are shorter than average but are extra large in diameter. Another new feature on these machines is the use of forming slides mounted on hardened and ground cylindrical steel stubs entirely encircled by their bearing and protected from chips and dirt, tending to preserve the initial accuracy of the slides. The slides are fitted with hardened and ground tool-holder bases and provided with micrometer adjustment.

The cross slides are all independently operated and actuated by cams of the flat disc type.

The tool slide, square on the four-spindle models and hexagon on the six-spindle models, is actuated forward and reverse, by a drum type cam through hardened and ground roll and torque guide which reciprocates between hardened plates.

Another important feature is spherical roller chuck operating device, consisting of a series of barrel-shaped rollers held in and actuated by hardened and ground high carbon alloy sleeves. When the outer sleeve is actuated by the chucking shoe, the rollers are forced radially toward the center of the spindle, giving axial movement to the chucking tubes.

When any spindle runs out of stock, the machine stops with the collet open and the stock stops in position. At the same

time a signal light flashes to notify the operator that the machine needs attention. A safety oil pressure switch interconnected with the circulation lubrication system in such manner that the machine cannot be started until predetermined pressure has been built up in the system.

High spindle speeds providing a maximum efficiency on any type of material are available. On the Models 40 and 60, speeds range up to 3800 r.p.m. while on the Models 41 and 61, speeds up to 250 r.p.m. can be obtained.

## The Cincinnati Shaper Company

Cincinnati, Ohio

Booth No. 603, North Annex

Included in this exhibit will be an All-Steel Shear and a new High Speed Universal Shaper especially designed for the toolroom and die shop.

A companion machine to the Cincinnati All-Steel Press Brake, this All-Steel Shear offers the advantages of rolled steel plate construction. The frame is of unbreakable steel, which makes it

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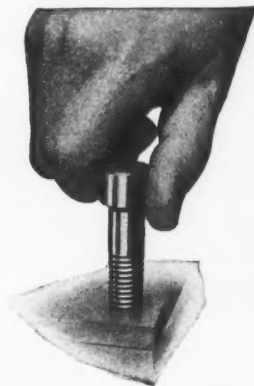
# NEW NEW NEW KNURLED "UNBRAKO"



## Socket Head Cap Screw



Order by Name; Specify:  
The  
"Knurled Unbrako"



U. S. and Foreign Pats. Pending

### THE KNURLED "UNBRAKO"

Every mechanic, when driving screws, will invariably persevere with his fingers until he has to give up—but not before.

With the Knurled "Unbrako" he can drive much further and faster because his fingers actually become geared to the Knurled head.

**Old Smooth-Head**  
Fingers Slip and Slide.  
Hard and Slow to Drive.

MANUFACTURED BY

## STANDARD PRESSED STEEL CO.

Box 555

JENKINTOWN, PA.

sible both a high degree of accuracy and high speeds on square shearing, notching, and slitting operations. One simple adjustment prepares the machine for slitting or for squaring and notching.

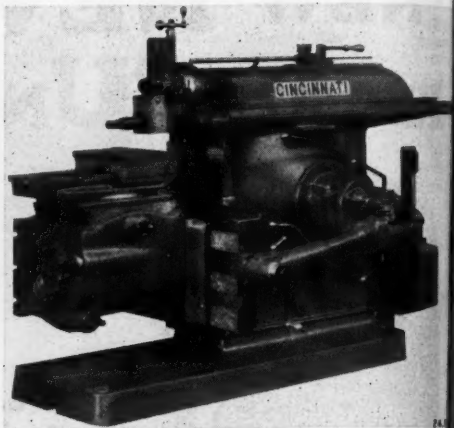
The heavy, uniform pressure exerted by the hydraulic hold-downs prevents sheet slippage regardless of variation in the thickness of the sheets. The hold-downs comprise a series of independent plungers of 12-in. centers actuated by oil pressure. The pressure may be varied by a simple adjustment of two nuts, precluding the marking of soft sheets. Light or heavy gauge sheets may be clamped without adjustment of the hold-downs.

The drive is by V-belt from the motor to the flywheel, then through a silent worm and wheel reduction unit to the main shaft. The worm is hardened and ground and the worm wheel has a rim of high tensile worm gear bronze mounted on a steel disc. The five clutch jaws are cut into this disc and hardened. Clutch parts are hardened and with the worm and wheel run in a bath of oil.

Pitman links and counterbalance pull backward as well as vertically on the

mountings and thus prevent damage from overload.

The new Cincinnati Universal Shaper



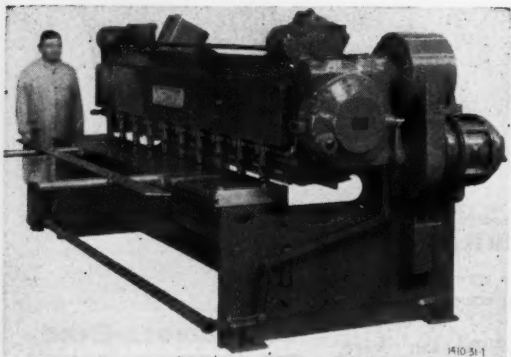
Cincinnati High Speed Universal Shaper

is equipped with a revolving table with a tilting top, without hinges, jacks, table support. The universal table revolves to any angle. It has one end face, similar to the box table on a standard shaper, and one tilting face with adjustment up to 15 deg. either way on an axis at right angles to the trunnion. Each movement is made by a crank wrench through worm and worm wheel. Graduations are indicated on the table. With the swiveling vise, work can be rotated all three possible axes.

An oversize trunnion apron, cast in one piece, has been substituted for the outer support on all sizes to and including the 20-in. heavy duty size, providing a heavy, rigid, self-supporting table. This universal shaper can be relied upon for permanent accuracy when roughing and finishing cuts are taken. The 32-in. and 36-in. sizes have all the Universal features, but have a table

support.

Each shaper is equipped for 8 cutting speeds, either 7 or 9 feeds to the inch and 11 cross feeds ranging from 0.010 to 0.170 inch. The horizontal travel of the table is 24 in. on the four smaller sizes.



Cincinnati All-Steel Shear

upper knife bar, and hold the knife bar against the flat guide bearings. Spring counterbalances pull backward as well as upward, also holding the knife bar against the guides. Safety friction discs allow the flywheel rim to slip on its

Why has Sunoco Emulsifying Cutting Oil won consistent use in leading machine shops? Check up its performance record!

Why has Sunoco Emulsifying Cutting Oil won consistent use in leading machine shops?

Check up its performance records! They tell the story! You'll find that Sunoco helps avoid the costly handicaps of frequent tool regrindings, rejected work through faulty finish, inaccurate tolerances and slowed-up production. It's a superior lubricant, a superior coolant.

Experienced machinists know Sunoco. They have seen at close hand how it aids machine tools in producing better work with greater ease and efficiency.

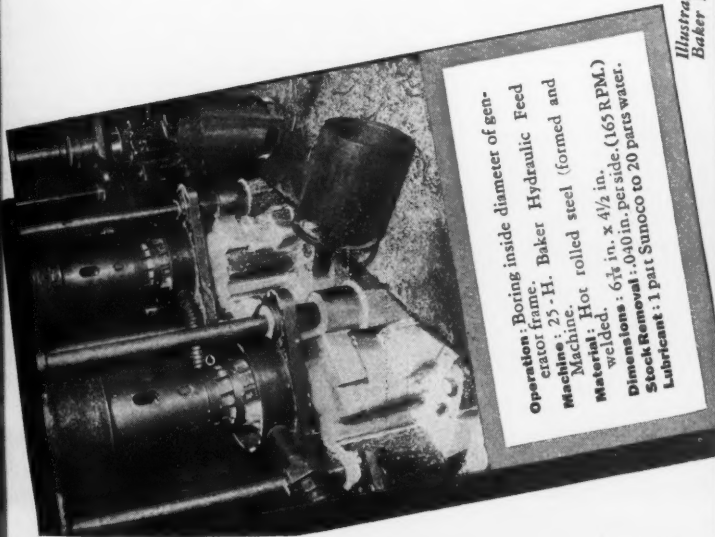
That holds true of the grinding operations, too. Sunoco is a factor in eliminating burning and glazing; it makes possible faster stock removal without increasing wheel wear.

*May we send further information or may our cutting oil engineers cooperate?*

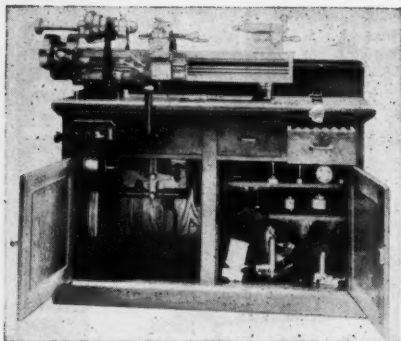
# SUNOCO

## EMULSIFYING CUTTING OIL

*Illustrations through Courtesy of  
Baker Bros., Inc., Toledo, Ohio*



# SUN OIL COMPANY Philadelphia



**Rivett No. 608 Precision Back-Geared Screw-Cutting Lathe**

and 30½ in. on the four larger sizes, and the vertical table travel is 13 inches.

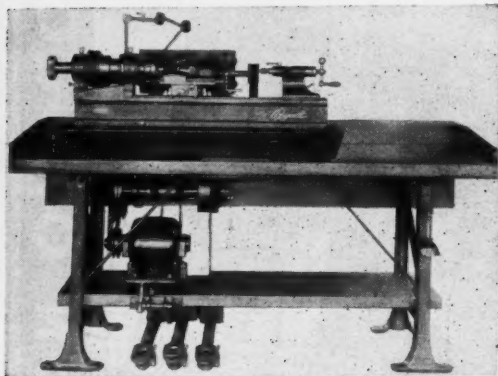
### **Rivett Lathe & Grinder, Inc.**

Boston, Mass.

#### **Booth No. 1010, North Annex**

Included in this exhibit are the following: Rivett No. 608 Precision Back-Geared Screw-Cutting Lathe, Rivett No. 505 Enclosed Head Roller-Bearing Lathe, Rivett No. 505 Open Head Roller-Bearing Lathe on Oil Pan, Rivett No. 505 Open Head Ball-Bearing Lathe, Rivett Universal Automatic Slide Rest, Blanchard Pulsator Automatic Oiling System.

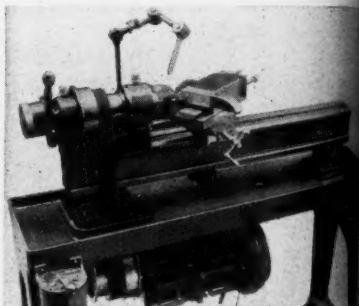
The Rivett No. 608 Precision Back-Geared Screw-Cutting Lathe is equipped



**Rivett No. 505 Open Head Roller-Bearing Lathe on Oil Pan**

with a quick change gear box and is mounted on an oak cabinet. Power is transmitted by an endless flat belt drive from the Rivett speed box motor. A dual sheave is used, providing six spindle speeds both forward and reverse. The operation of the machine is controlled with a hand lever and automatic brake. The lathe is mounted on jack pedestals which permit tensioning the driving belt and provide three-point mounting for the lathe.

The Rivett No. 505 Enclosed Head Roller-Bearing Lathe is mounted on a unit bench with drive as described above. The Rivett compound slide rest is equipped with a thread-cutting at-



**Rivett No. 505 Ball Bearing Lathe Equipped with Rivett Universal Automatic Slide Rest**

tachment. This lathe is equipped with Timken Precision Roller Bearings with maximum spindle speeds of 2000 r.p.m.

It is built with or without enclosed head. Jack pedestals provide three-point mounting for the bed and permit tensioning of the endless flat belt drive. Multiple V-belt from the speed box three-step cone pulley to sheave.

The Rivett No. 505 Open Head Roller-Bearing Lathe on Oil Pan is mounted on a unit bench with rivet horizontal safety drive. It has dual drive providing six spindle speeds both forward and reverse, hand foot treadle control and oil pan and piping for cutting fluid. All belts are provided with screw attachment for tensioning.

The Rivett No. 505 Open Head Ball-Bearing Lathe mounted on oil pan and floor legs is driven by an endless flat belt from



# New!

## 1935 WHITNEY HAND MILLER



MANUFACTURED BY

W. H. NICHOLS • WALTHAM, MASS.

U S A

Rivett speed box motor drive, and three-step sheave, providing eighteen spindle speeds both forward and reverse. It is equipped with automatic brake and latch-foot treadle control. The lathe is equipped with an oil pump and piping, roller-bearing lever, chuck closer, and Rivett universal unit motor-driven automatic slide rest. It is also provided with three-point mounting.

The Rivett Universal Automatic Slide Rest is designed automatically to turn any desired angle. Used with a Rivett No. 505 Ball-Bearing Lathe having spindle speeds up to 4600 r.p.m. and Rivett Speed Box motor drive and automatic brake, it comprises a high-production attachment. By depressing the operating lever in front, the tool is brought into position and the unit motor, through quick change gears, automatically advances the top slide. At the end of the cut the tool automatically drops down and away from the work ready to start another cycle.

The Blanchard Pulsolator Automatic Oil-Lubrication System will be exhibited in operation on various machine tools. The pump units drive off the machine and at regular intervals feed a definite amount of oil to each bearing through gangs of sight feeders.

### Farrel-Birmingham Company, Inc. Buffalo, N. Y.

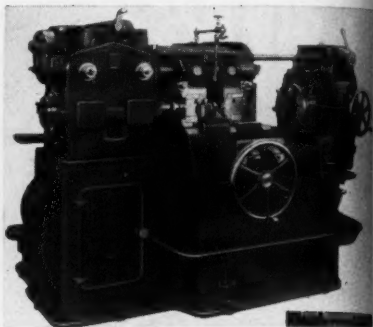
#### Booth No. 105A, North Annex

Included in this display are a No. 1-A Sykes Gear Generator, a Sykes Gear Tooth Comparator, Gear Unit, Flexible Coupling, and examples of parts produced by Sykes Gear Generators. Improvements which improve the accuracy, increase output, and facilitate operation have been incorporated in the Farrel-Sykes Gear Generating Machine, which is of the latest type.

Although extremely rapid in action, the new features of design make the machines remarkably quiet in operation. High precision is ensured and maintained by the use of hardened, ground, and lapped surfaces where it is likely to affect precision and by provision of means for compensating for wear.

The cutter relief mechanism automatically withdraws the cutters from the work during their return stroke, thus preventing damage to the cutting edges of the tools. During the cutting stroke the mechanism positively locks the housings carrying the cutter spindles with the cutter heads. The operating parts of each cutter head are lubricated by an individual pump which uses the relieving bar as a pump piston.

The helical guides are of entirely new design. In place of one groove and one shoe in each guide, two are now provided. In the smaller machines, the shoes are carried in a flanged sleeve which also carries the reciprocating guide member; thus each set of guides is an integral unit, readily removable, providing an easy means of changing from helical to



No. 1-A Sykes Gear Generator

straight teeth or from one helix angle to another.

A new automatic feed has been developed which automatically feeds the work toward the cutters in any desired increment per revolution of the work and these increments may be uniform or variable as required. Depth of feed per revolution or total depth may be altered or regulated without stopping the machine, and the machine can be stopped automatically when the final cut has been taken.

Adjustments have been simplified and controls have been brought to the front of the machine. All parts, with the exception of the saddle, are lubricated by a positive oil-circulating system.

Optical measuring instruments are employed for controlling the indexing of the work wheels individually, and the three worm wheels are optically inspected, as a group, exactly as they function when the machine is in operation. Three dials are installed, one on each cutter spindle and one on the main spindle, and three microscopes are used simultaneously, disclosing all errors which may be in the gear train as well as in the indexing worm wheels themselves.

In addition to their ability to cut herringbone gears with continuous teeth having sharp apices, Sykes machines will also generate any known type of

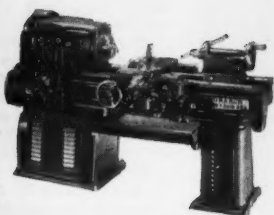
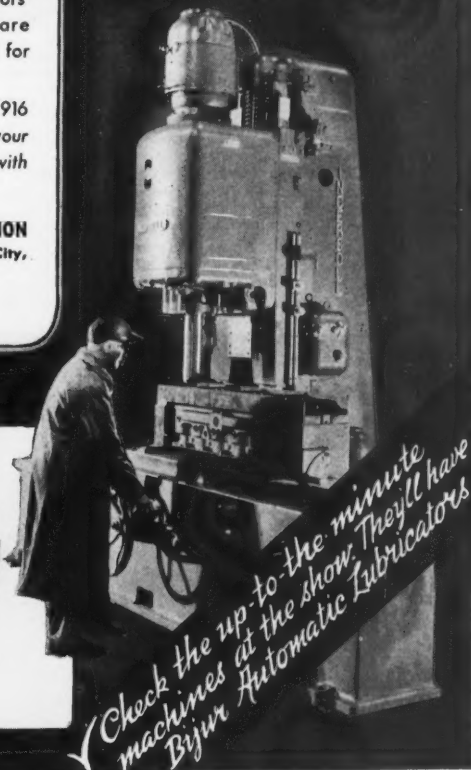
# ... Up-to-the-minute machine tools have **BIJUR AUTOMATIC LUBRICATION**

Within a few years  
BIJUR AUTOMATIC LUBRICATORS have  
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herringbone gear, straight tooth and single helical gears with external or internal teeth, splined shafts, cluster gears, sprockets, and a variety of other forms.

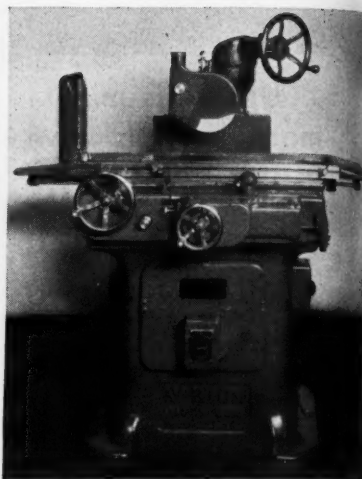
## Norton Company

Worcester, Mass.

### Booth No. 101, North Annex

Norton Company will exhibit 10 grinding and lapping machines, all of which will be under power and producing work at the rate intended for the machine to operate in the customers' plants. For the automotive industry, a new crankpin grinder, known as the D-86, and an improved cam contour grinder, known as the Cam-O-Matic, will be exhibited. Of interest to automotive machinery buyers as well as manufacturers of other equipment will be two new 6-in. Type C machines, a 6x18-in. Semi-Automatic, and a 6x30-in. Hydraulic Traverse Machine with hydraulically operated continuous power cross feed. A 10x36-in. Type C Hydraulic Traverse Machine with hydraulically operated power cross feed will also be shown.

Users of tool and cutter grinders will be interested in two new tool and cutter grinders; a No. 1 machine with 10-in. swing, and a somewhat larger No. 2 machine with 12-in. swing and hydraulic table traverse. Another tool room machine, the 6x18-in. Surface Grinder with a much larger wheel spindle, driven by an imported flat belt known as the "Hevaloid", will also be shown. One of the operations performed will be the grinding of tungsten carbide using Nor-



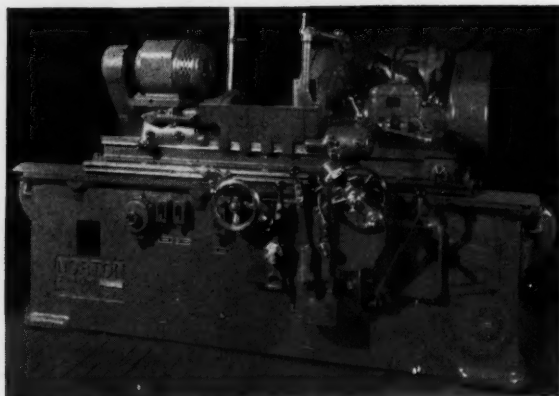
Norton No. 1 Universal Tool and Cutter Grinder with Universal Work Head Arranged for Motor Drive

ton diamond wheels. The form grinding of flat cutters will also be demonstrated and possibly the grinding of dies.

Two lapping machines will be shown. One is a new vertical machine equipped with bonded abrasive laps, known as the No. 24 or "Hyprolap". The other lapping machine is a Norton 10-U (universal) which will be suspended from the floor at three points by a set of steel cables

lapped to such accuracy that when wrung together they adhere without any physical connection whatever. The machine will be in operation lapping small piston rings, small gaskets and hardened thrust washers.

Norton Company has adopted the general practice of mounting a wheel drive motor directly on the wheel drive unit on all of its cylindrical grinders. The grinding wheel spindle is end-driven by multiple V-belts directly from the motor, no idlers or intermediate shafts being employed. With this design vibration is reduced to a minimum.



Norton 10x36-in. Type C Cylindrical Grinder arranged with Hydraulic Table Traverse and Power Wheel Head Traverse

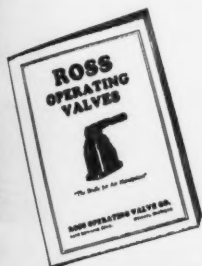
# ROSS VALVES

*"the bridle for air horsepower"*

## Save Air Costs

**R**OSS Operating Valves truly "put a bridle on air horsepower." Accurate and positive control is assured over a long period of use. Flexible seats—quickly renewable—eliminate all lapping or grinding and reduce "shut down" time to a minimum. Designed upon poppet principle with air pressure against seats to insure positive seal. Can be mounted on brackets to which piping is permanently attached.

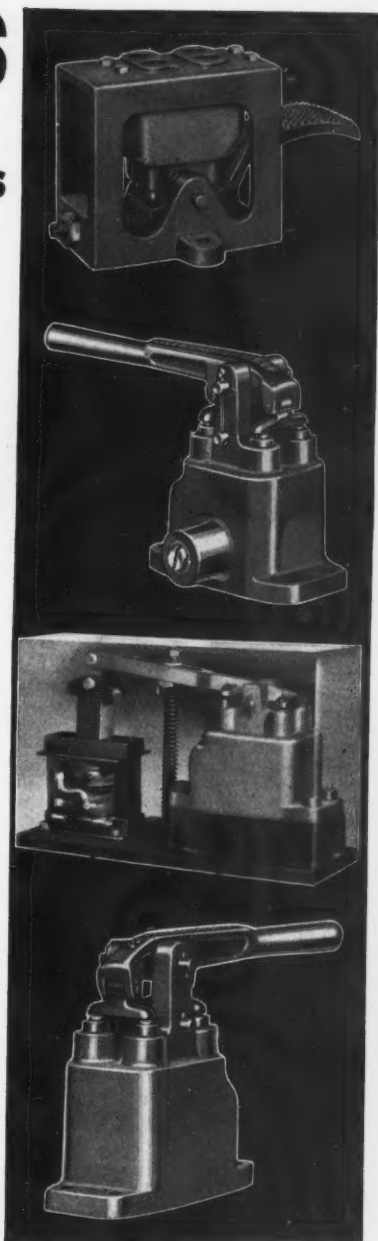
Ross Operating Valves are manufactured in sizes ranging from  $\frac{3}{8}$ " to  $1\frac{1}{4}$ " for the control of single or double acting cylinders. Standard designs for hand—foot—mechanical—or electrical control. Investigate their possibilities for your use today.



Complete catalog, giving types, description and specifications, sent on request.

### ROSS OPERATING VALVE CO.

6488 EPWORTH BLVD.  
DETROIT MICHIGAN





Norton 6x18-in. Surface Grinder with Hydraulically-Operated Cross Feed

cases the spindle bearings are flood lubricated and the wheel slide ways are forced-feed lubricated, as are the table ways.

The No. D-86 is an entirely new machine for grinding automotive crankpins. But two levers and one hand wheel are required to operate the machine, one lever controlling the work rotation, opening and closing of work holders, rapid and slow traverse of wheel movement, and rapid movement of the table from one pin to another. The other lever is used for "jogging" the table to align the work with the wheel and the hand wheel is used to feed the grinding wheel into the work.

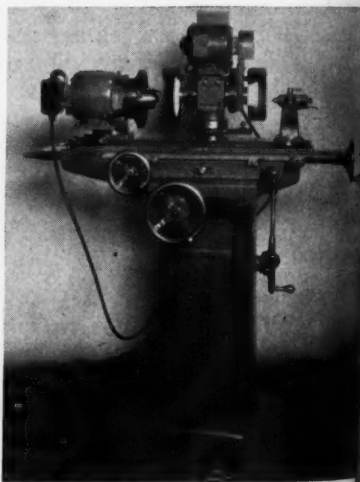
An interesting feature of the machine is the "Lo-Rest", which is a hydraulically-operated steadyrest that automatically drops clear of the work when moving from one pin to the next. Still another feature is the ability to stop the work holders automatically in loading position. The machine is of the double head type with work head spindle  $6\frac{1}{4}$  in. diameter by 29 in. in length, and the upper bearing is a full half cap.

The Norton "Cam-O-Matic" automatically and successively grinds each cam on a camshaft, trues the grinding wheel, and stops for reloading. All the operator does is load the machine, press a push button and move one lever which

starts the functioning of the automatic cycle. This starts the work rotating and feeds the grinding wheel in rapidly until it contacts the work, when it slows down to a grinding feed. A timing unit causes each cam to make exactly the same number of revolutions in contact with the grinding wheel and the wheel to leave the work upon completion of grinding at the nose of the cam, which is very important. A new work drive unit provides a speed range of from 18 to 75 r.p.m.—a range suitable for either roughing or finishing.

The new hydraulic 6-in. plunge-grinder is being shown for the first time. These Semi-Automatic Machines require an operator simply to load the machine and move a lever which starts the automatic cycle. Moving this lever (1) starts the work rotating, (2) causes the grinding wheel to be fed in rapidly to grinding position, (3) feeds the wheel slowly until the work piece has been reduced to size, (4) causes the grinding wheel to recede rapidly, (5) stops rotation of work, and (6) returns the machine control lever to its initial position. The operator then reloads the machine and proceeds as before.

The Norton "Hyprolap" is also an



Norton No. 10-U Lapping Machine for Flat and Cylindrical Pieces

entirely new machine from the base of this is a lapping machine which is hydraulically operated and designed for high production flat work up to 6



# MACHINE TOOLS GO MODERN WITH CHAIN DRIVES

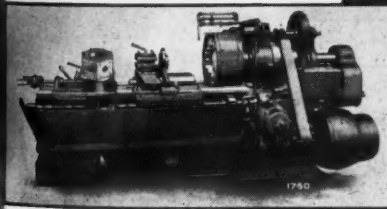
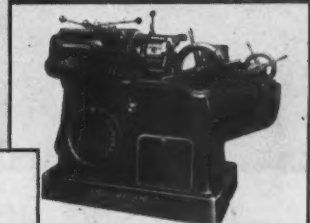
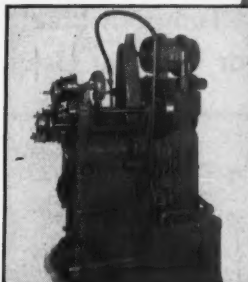
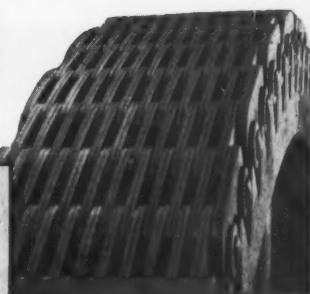
At the Machine Tool Show (and surely you will be there) you'll quickly realize the preference Machine Tool Manufacturers have for chain drives. Although proved in use over a period of many years, this type of transmission is really the modern drive. No other drives have been discovered that are as reliable, positive, efficient and long-lived as silent or roller chain drives.

Modernization — the topic of the show, can well begin with a thorough consideration of power transmission in your own plant, as well as on the tools you make. Increased production at lower costs — the real result of modernization, has come from a study of this production factor.

You'll find it worth your while to visit the Morse Chain Exhibit at the show—Morse, as you know, is one of the largest manufac-

turers of silent chains, roller chains, couplings, and clutches. Morse engineers will be on the job to take good care of you.

*But, by all means, visit the Machine Tool Show at Cleveland.*



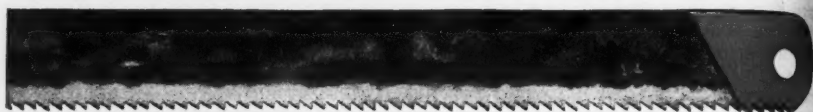
**MORSE CHAIN CO.**  
ITHACA, N. Y.

DIVISION OF BORG-WARNER CORPORATION

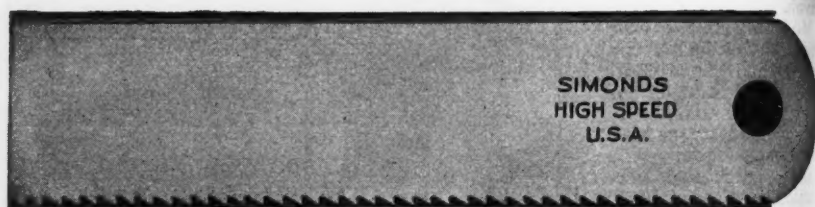
## LEADING MACHINE TOOL MANUFACTURERS USE MORSE CHAINS

- |                                |                                  |
|--------------------------------|----------------------------------|
| Abrasive Machine Tool Co.      | Consolidated Machine Tool Corp.  |
| Acme Machine Tool Co.          | Fellows Gear Shaper Co.          |
| Avey Drilling Machine Co.      | Foot-Burt Co.                    |
| Barber Colman Machine Co.      | Gisholt Machine Co.              |
| W. F. & John Barnes Co.        | Ingersoll Milling Machine Co.    |
| Bradford Machine Tool Co.      | Jones & Lamson Machine Co.       |
| Brown & Sharpe Mfg. Co.        | Landis Tool Co.                  |
| Bryant Chucking Grinder Co.    | Landis Machine Co.               |
| Carlton Machine Tool Co.       | Lodge & Shipley Machine Tool Co. |
| Cincinnati Grinders, Inc.      | Monarch Machine Tool Co.         |
| Cincinnati Milling Machine Co. | New Britain-Gridley Machine Co.  |
| Cincinnati Shaper Co.          | Norton Company                   |
| Cone Automatic Machine Co.     | Rockford Drilling Machine Co.    |
|                                | Rockford Machine Tool Co.        |
|                                | Warner & Swasey Co.              |

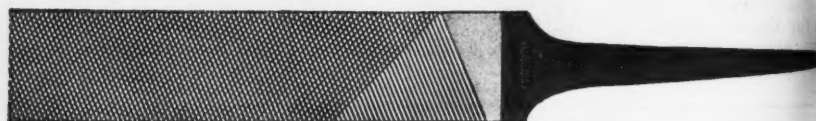
# SIMONDS



**'RED END' Tungsten Steel Hack Saws  
for General Use**



**"RED STREAK" High Speed Steel Hack Saws  
for Production Sawing**

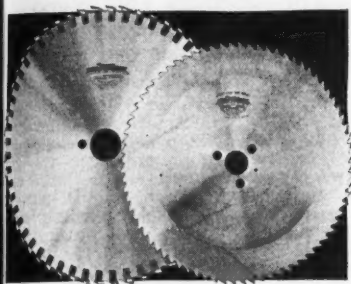


**"RED TANG" FILES—for Highest Quality**

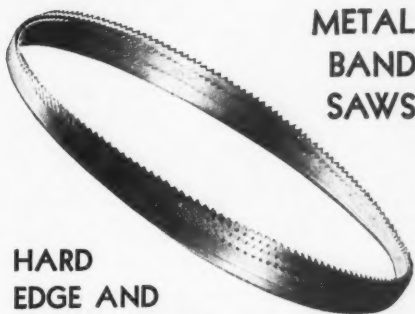
***Buy and Use these Tools with***

**Ask Your Supply Dealer  
or write SIMONDS for further details**

# FAMOUS FAMILY OF METAL CUTTING TOOLS



SOLID AND INSERTED TOOTH  
METAL CUTTING SAWS

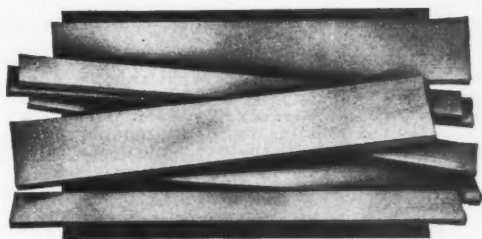


METAL  
BAND  
SAWS

HARD  
EDGE AND  
SPRING TEMPER



TOOL HOLDER BITS  
HIGH SPEED STEEL  
AND SUPER COBALT



FLAT GROUND STOCK  
FOR MAKING DIES, JIGS, ETC.

ols with **Utmost Confidence**

**SIMONDS SAW AND STEEL CO.**

"The Saw Makers"

FITCHBURG, MASS.

across its longest dimension or cylindrical work up to 6 in. in length. Twenty-four in. diameter bonded abrasive laps are used, both of which rotate, but in opposite directions and at different speeds. Two hydraulic cylinders—one on each side of the upper lap spindle—raise and lower the upper lap and are also utilized to provide pressure to the work during lapping. The machine is driven by a motor through a clutch and brake, the drive being applied to the upper lap by a standard automotive universal joint and multiple V-belts.

The Norton No. 2 Universal Tool and Cutter Grinder is a tool room machine of entirely new design. One of its principal features is the hydraulic table traverse mechanism for cylindrical or internal grinding or the grinding of cutters. The wheel spindle is V-belt driven from a motor mounted directly above the wheel head on the post which carries the spindle and which is raised and lowered by means of an elevating hand wheel.

The universal work head takes milling cutters with National Standard tapered shanks or with No. 12, 10, 9, and 7 B & S tapers. When equipped with the motor drive arrangement, the unit becomes a headstock for driving cylindrical work and when equipped with the three jaw universal chuck, internal work or sides of thin cutters or saws can be ground.

When the machine is to be devoted exclusively to cutter grinding, it can be equipped with a left hand footstock which, with the standard footstock, provides for the grinding of cutters mounted on centers. Both the left hand foot-

stock and the universal work head are graduated for setting clearance angles when backing off cutter teeth. The universal work head has, in addition, two sets of graduations by means of which the work spindle can be swiveled both horizontally and vertically and set at any angle.

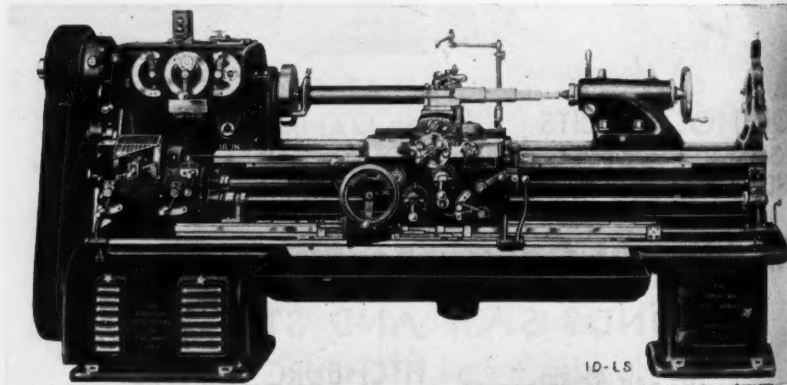
## The American Tool Works Company

Cincinnati, Ohio

Booth No. 901, North Annex

The feature of the "American" exhibit will be an "American" Multi-Production Lathe which was developed for the express purpose of filling the gap between the standard engine lathe and the highly specialized, single purpose automatic lathe. This machine combines the adaptability and range of the standard engine lathe with the productive characteristics of single purpose turning equipment. To match the steady improvement in new high speed cutting alloys and in anticipation of their increasingly extensive use in turning operations, the Multi-Production Lathe has been endowed with the enormous power, inherent stamina and high speeds essential to the utilization of the full cutting properties of these new alloys. Power, speed, rigidity, tool and chip control, and rapid and convenient manipulation are outstanding features of the lathe.

To provide for automatically stopping the carriage feed at pre-determined points, a highly accurate and positive quick setting automatic longitudinal



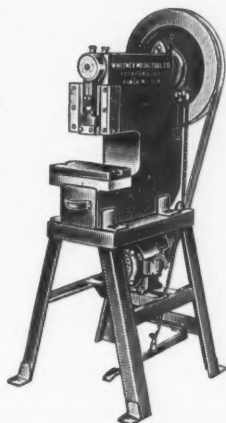
20-In. "American" Multi-Production Lathe

# WHITNEY

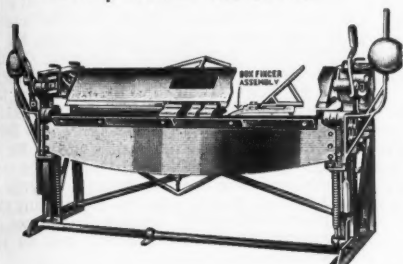
## AT BOOTH No. 16

- Whitney Tools are known the world over for the quality of material, advanced design, and expert workmanship used in their construction.

This New No. 128 Heavy Duty Punch, for example, is modern, strong, and durable in design yet of comparatively simple construction. All parts are standardized. See this new punch at the show.



- There are 17 new improvements over other steel bending brakes incorporated in the Whitney-Jensen Brake (at left). That is why this brake is extensively used by progressive sheet metal shops. Our new bulletin gives all details.



No. 4 Angle Iron Shear



No. 10 Punch

- There are over 80 items in the Whitney line from which to choose, including punches, punch accessories, notchers, shears, brakes, etc. Ask for literature and be sure to visit Booth No. 16 at the show.



No. 8 Imperial Punch

# WHITNEY METAL TOOL CO.

91 FORBES STREET

ROCKFORD, ILL.

stop mechanism has been devised which provides a degree of accuracy and ease of setting. For quickly and accurately locating the stop dogs which actuate this mechanism, a large rust-proof scale is slidably mounted in the front face of the outer bed way.

Hand-operated positive-diameter stops of the barrel type are an important item of standard equipment. This mechanism provides for five work diameters and carries adjustable stop dogs for both front and rear cutting tools. The accurate construction and positive functioning eliminates the necessity for calipering the work. Dual Direct-Reading Cross Feed Dials which are geared to the cross feed screw so as to read directly in terms of work diameters facilitate the setting of cross feed stops and accurately determine work diameters when the cross stops are not in use. One dial is graduated in fractions and the other in thousandths; thus mental calculations are eliminated.

A live tailstock center is used owing to the high work velocities permitted by the use of cemented carbide cutting tools. The center is roller bearing and is built into the tailstock spindle, forming a highly stabilized unit which is capable of withstanding the most severe stresses resulting from the use of cemented carbide tools.

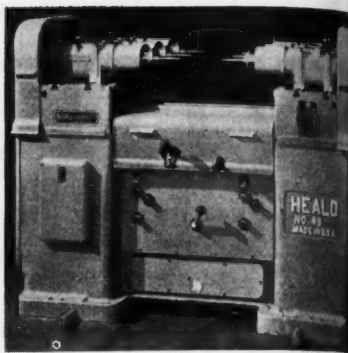
To protect the operator against the danger of flying chips when turning work at high speeds, a patented chip breaker and controller is affixed to the cutting tool; thus the chips are broken into small sections and directed into the chip pan.

### The Heald Machine Company

Worcester, Mass.

Booth No. 206, North Annex

This exhibit will include Internal Grinders, Rotary Surface Grinders, a Tool

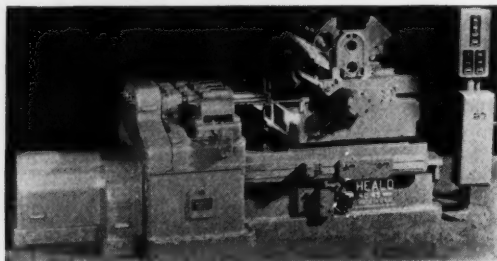


Heald No. 45 Bore-Matic Precision Boring Machine

Sharpening Machine, and Precision Boring Machines in various types and sizes including nine machines that have never before been presented. The machines are a Style No. 72A Gap Internal Grinder, Style No. 73 Airplane Cylinder Grinder, Style No. 74 Internal Grinder for large work, Style No. 81 Centerless "Size-Matic" Internal Grinder, Style No. 81 Centerless Gage-Matic, Style No. 44 Bore-Matic Precision Boring Machine, Style No. 45 Bore-Matic Precision Boring Machine, Style No. 49 Bore-Matic Double End and Style No. 50 Single End Boring Machine. All of the machines will be in operation grinding and boring Diesel engine connecting rods, airplane cylinders, cranes, ball races, refrigerator parts, automobile pistons, and miscellaneous parts.

The new Heald No. 72A Gap Internal Grinder was designed to handle gear plates, connecting rods, housings and similar parts with medium size holes but requiring a generous work swing, providing a heavy T-head base and work center, an unusually rigid, conveniently-operated machine is made available for grinding work-pieces that are usually awkward to handle on a rotating work fixture on the average machine. The machine has a grinding stroke of 7 1/2 in. and will swing work 38 in. diameter by 15 in. in length.

The machine is arranged with a hydraulic drive for the table and a quick-acting traverse device. The hydraulic table drive provided any speed desired. The work guard opened and closed by a



Heald No. 45 Bore-Matic Double-End Precision Boring Machine



# RIVETING

as fast as ~~1-2-3~~  
and much easier

THE "Hi-Power" Portable Hydraulic Riveter is an entirely new development for production riveting, comprising a portable yoke-type press weighing but 54 lbs., and a completely automatic hydraulic power generator driven by a 2 hp. motor and taking less than 1 square foot of floor space.

A single push button controls the entire operation of the press. Maximum pressure of 35,000 lbs. is available for heading  $\frac{3}{8}$ -inch cold rivets, and the complete cycle takes only  $2\frac{1}{2}$  seconds.

This combination of large capacity, high speed, and easy handling means new economies and remarkable production in any riveting operation within the capacity range.

See this new Hannifin Portable Riveter at the Machine Tool Exposition. Other Hannifin special production units for modern high speed manufacturing, and the complete line of Hannifin air and hydraulic presses, air operated chucks, valves, and other production tool equipment will also be shown.

Hannifin Manufacturing Company  
621-631 South Kolmar Avenue, Chicago, Illinois  
ENGINEERS • DESIGNERS • MANUFACTURERS  
Pneumatic and Hydraulic Production Tool Equipment

Machine Tool  
Exposition

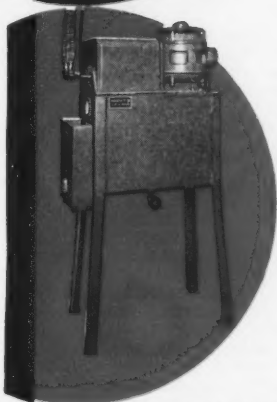
Cleveland, September  
11-21

BOOTH

104

# HANNIFIN

"hi-power"  
PORTABLE HYDRAULIC RIVETER



**PORTABLE YOKE RIVETING PRESS**—Weight 54 lbs. Throat of yoke 6 x 6 inches. With 4-inch reach, weight 45 lbs. Stroke 3 inches. Capacity  $\frac{3}{8}$ -inch cold rivet.

**HYDRAULIC PRESSURE GENERATOR**—Completely automatic valve and oil pump control. Working pressure 5,000 lbs./sq. in. Motor 2 hp. Dimensions 32 x 17 x 56 inches. Large volume delivery at moderate pressure for rapid advance and return strokes.

**OPERATION**—Complete automatic riveting cycle controlled by a single push button. Cycle includes rapid advance at moderate pressure, automatic high pressure delivered when die touches rivet, and reversed at peak pressure with rapid return to starting position.

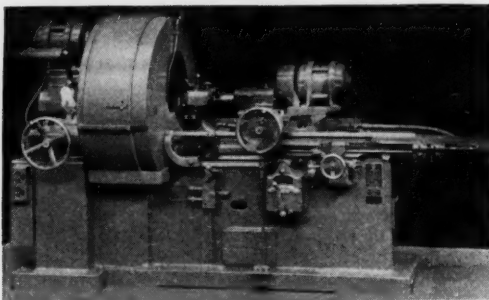
At end of return stroke controls automatically move to neutral and oil pump idles at zero pressure.

**SAFETY**—No repeat—the control button must be released and pressed again for another cycle. It must be held instant safety stop—releasing the control button at any point in the cycle automatically reverses the ram and returns it to starting position.

draulic cylinder and piston at the rear of the machine, the control valve for which is within easy reach of the operator. The work guard swings completely back out of the way to facilitate loading an overhead crane. The operating units and drives are similar to the Style No. 72A Heald Internal Grinder. The floor space required is 116x60 1/4 in. and the

controls are built into the base of the machine and the operating controls of the entire machine are located within a small radius of the floor of the base. Cams start the boring heads slightly in advance of the reduction boring speed.

The main drive motor with its drive connected oil pump is mounted upon a vibration-dampened plate to isolate any vibration from the base. The drive is taken from multi-strand V-belts from the unit to the clutch and brake units, which are of the direct hydraulic self-adjusting type and are mounted on vibration-dampened plates. An eight-gallon reservoir for cutting lubricant is provided in the base. The maximum diameter that can be bored is 6 1/2 in. and the minimum diameter is 1/8 in. The maximum length of hole that can be bored depends on the hole diameter. The weight without the boring heads is 5500 pounds.



Heald No. 72A Gap Internal Grinder

net weight of the machine is 9,000 lbs.

The No. 45 Bore-Matic is a machine of low, heavy construction for boring precision holes in large irregular shaped work. The machine as shown is being used for boring cylinder holes in V-8 cylinder blocks. Four bores on one side of the block are finished at one pass of the machine, then the block is reversed and the four bores on the opposite side are bored.

The No. 45 Bore-Matic has a reciprocating table and stationary bridge for the boring heads. Up to seven heads are accommodated depending on their size. The control panel is mounted on a floor stand adjacent to the machine and within easy reach of the operator. The panel is made up of a number of push buttons with which the various functions of the machine are controlled.

The Heald No. 49 Bore-Matic is a small double end machine designed and built for the boring of several operations in individual parts from opposite ends or for boring a number of different parts that can be handled in the same setting. Weighing approximately 5500 lbs., the machine is extremely massive for its size and has capacity for four of the smaller size boring heads at each end of the machine. The construction of the various units and the liberal use of vibration dampeners eliminates the transmission of vibration to the boring spindles or to the work.

All electric starting and hydraulic con-

## Fosdick Machine Tool Company

Cincinnati, Ohio

### Booth No. 1004, North Annex

Four drilling machines of recent design—a 5-ft., 17-in. Column Radial Drill 25 in. Upright drill with compound table; No. 4, 16-in. Sensitive Drill with tapping attachment, and a No. 5, 12-in. Sensitive Drill with power feed—prise this exhibit. The 25-in. Upright Drill is of the Fosdick standard design arranged with a compound table, a gage end indicator device for accurate positioning work for boring. This machine has 12 spindle speeds, from 1500 r.p.m. with nine feeds, ranging from 0.005 in. to 0.043 in., with a lever control for both speed and feed changing. The machine is ruggedly built and is suitable for both universal production use.

The No. 4 Sensitive Drill is equipped with a direct coupled motor drive. The motor has two speeds and, with a speed box mounted in the rear of the machine, provides a total of six speeds from 225 to 1800 r.p.m. The tapping attachment is of the reversing motor type and is extremely sensitive. It is controlled by the motion of the rack pinion hand wheel, running right hand as the spindle is brought down and reversed as the spindle returns. An adjustable depth stop backs out the tap at a pre-determined point.

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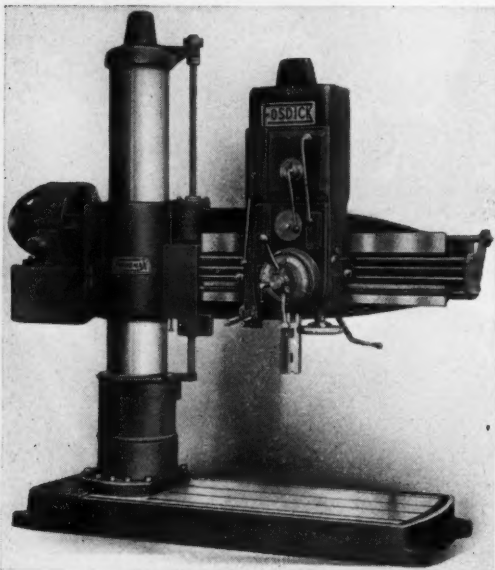


**VACUUM OIL Co.**

**INCORPORATED**  
WHITE STAR DIVISION - LUBRITE DIVISION - WHITE EAGLE DIVISION -  
PETROLEUM COMPANY - GENERAL PETROLEUM CORP. OF CALIFORNIA



The No. 5 Sensitive Drill is similar in type to the No. 4 Machine, except that it has a power feed and no tapping attachment. The power feed is engaged by downward motion of the hand wheel and disengaged by upward motion. The power feed may be disengaged by setting the depth stop, which is accurate to within 0.010 inch.



Fostick 5 Ft., 17 Inch Radial Drill

The 5-ft., 17-in. Column Radial Drill is designed to provide simplicity of operation and ease of controlling power movement. The spindle is driven from a motor mounted on the arm and connected through a reduction gear to the back driving shaft of the head. This motor also drives a hydraulic pump for supplying fluid power for control and traverse of the head and arm.

The arm, which is of rigid double box construction, is mounted on the column sleeve where it is clamped by a hydraulic self-locking clamp. Hydraulic power is used to raise and lower the arm, the power being applied through a clutch in which Nitralloy plates are used. The sleeve rotates on the inner column mounted on a heavy ball bearing at the top of the column and on a pair of roller bearings at the bottom, thus eliminating friction due to the over-

hanging weight of the arm. The column sleeve is clamped by a hydraulic self-locking clamp.

Thirty-six speed changes are available through sliding gears of chrome molybdenum steel. Eighteen feeds are available from 0.003 to 0.125 in. per revolution and incorporating pipe leads of 11½, and 8 thread. The feed is engaged by a powerful but easily operated friction clutch.

The head is hydraulically traversed in any speed up to 15 ft. per minute, controlled by a lever on the right side of the head. The handle which controls the hydraulic clamp for the column is also at the right side. On the left side of the head is the lever which clamps the head to the column and on this same side is the arm-raising and lowering handle which is self-indicating for direction and controls the hydraulically operated elevating clutch. The elevating handle, column clamp handle and rapid traverse handle automatically return to neutral positions when released. When this happens, all hydraulic pressure in the system drops to practically zero thus requiring little power when not in use. The movement of the handle by the operator instantly restores hydraulic pressure for operation.

#### Landis Machine Company Waynesboro, Pa.

Booth No. 204, North American

The Landis exhibit includes a "Lanhydro" Threading Machine, Landis Threading and Cutting Machine, Receding Chaser Die Head, "Little Landis" Pipe Threading and Cutting Machine, Landis Automatic Forming Threading Machine, Landis Hardening and Ground Die Heads, and Landis Collapsible and Receding Chaser Taps.

Hydraulic power has been applied to the "Lanhydro" Threading Machine providing for a remarkably wide range and flexibility. Hydraulic mechanism can be furnished to provide an automatic magazine feed, carriage feed, return which controls mechanically opening and closing of the die by hydraulic gripping and releasing of work, hydraulic engagement of the screw, and so on.

The second machine listed above is an adaptation of the Landis Pipe Threading

# GET THE JUMP ON YOUR COMPETITOR

by cutting costs with  
**ROTOR AIR  
WIRE BRUSHING TOOLS**

**FAST! POWERFUL! RUGGED!**  
**and EASY TO HANDLE!**

For thorough removal of  
rust, scale, and paint on

- Structural Work,
- Tanks, Boilers,
- Pipe Lines, etc.



## SPADE HANDLE TYPE

FOR RADIAL OR CUP BRUSH

E-0—for 6" x 1½" or 6" cup, 4¼ lbs.

E-1—for 8" x 1½" or 6" cup, 8¾ lbs.

D-1—for 6" or 8" x 1½" or 6" cup, 9¾ lbs.

## STRAIGHT HANDLE TYPE

FOR RADIAL BRUSH

E-0—for 6" x 1½", 4¼ lbs.

D-1—for 6" or 8" x 1½", 9¾ lbs.

## VERTICAL TYPE

FOR CUP BRUSHES

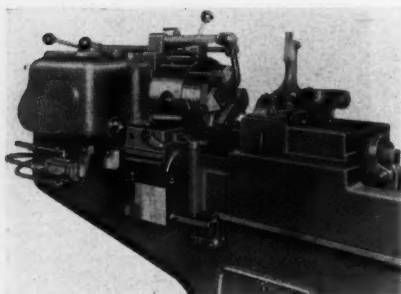
B-0—for 6" cup, 6 lbs.

B-1—for 6" cup, 9¾ lbs.

B-2—for 6" cup, 12½ lbs.

• GRINDERS • BUFFERS • SANDERS • DRILLS •

**THE ROTOR AIR TOOL CO., CLEVELAND, O.**



**Landis Pipe Threading and Cutting Machine  
With Receding Chaser Die Head**

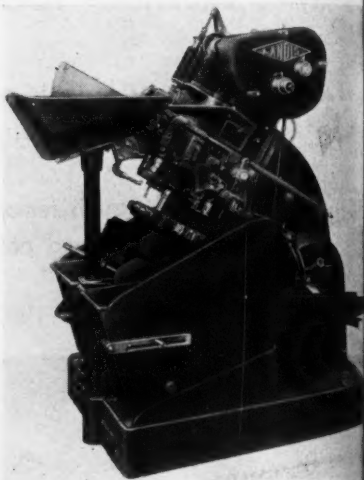
and Cutting Machine, the new features being a taper attachment operated receding chaser die head and a leadscrew. The receding chaser action of this machine minimizes cutting strains; thus it prolongs tool life and makes possible the cutting of well finished, accurate threads on the toughest of materials.

The "Little Landis" Pipe Threading and Cutting Machine is a light weight, semi-portable tool designed for maintenance and jobbing threading. The features of the machine facilitate quick set-ups. Pipe can be threaded from  $\frac{1}{8}$ -in. to 2-in. diameter and bolts, rods and similar work from  $\frac{3}{8}$  in. to  $1\frac{1}{2}$  in. inclusive are handled in this machine.

The Landis Hardened and Ground Die Heads included in the new series are designed for high production service and will produce to the closest of thread limits. These heads are producing heads to class 4 fit on a production basis in a number of plants. The new design of the heads, the materials from which

they are made, and the precise workmanship entering into their manufacture all insure efficient, dependable operation. The chasers employed in these heads are interchangeable with those used in the heat treated heads manufactured by the company.

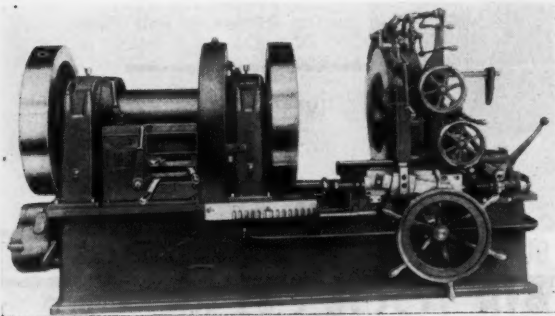
The new Landis Collapsible and Receding Chaser Taps are built in two types; the style LT Collapsible Tap which is recommended for the tapping of straight threads, and the style LR Receding Chaser Collapsible Tap which is designed for tapping tapered threads. The outstanding feature of these tools



**Landis Automatic Forming and Threading  
Machine**

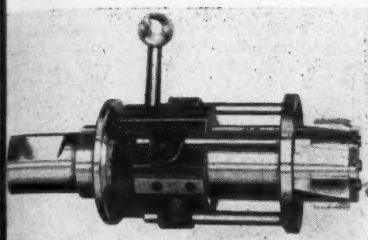
is the detachable hopper construction which permits the use of one body with separate heads of various capacities. The new design of the operating mechanism provides for greater rigidity, positive locking and collapsing action, and simplified, dependable adjustments.

The Landis Automatic Forming and Threading Machine is a fully automatic tool for producing and threading bolts. The machine is essentially a production tool. The relief val



**"Lanhydro" Threading Machine**





Collapsible and Receding Chaser Taps

Advantages of the machine consist in that, being fully automatic, one operator will handle a battery of from 4 to 6 machines.

## Gallmeyer & Livingston Co.

Grand Rapids, Mich.

Booth No. 307, North Annex

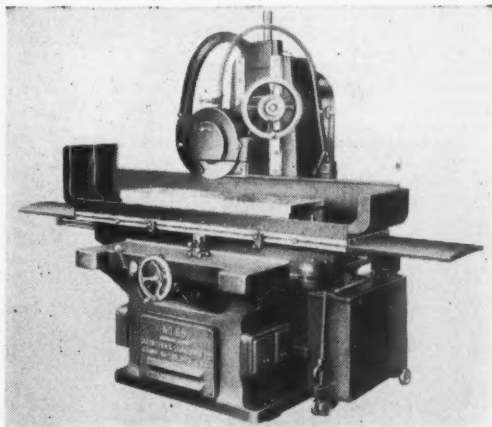
Included in this exhibit are several types of Grand Rapids Hydraulic Feed Surface Grinders, Grand Rapids Universal Cutter and Tool Grinders, Grand Rapids Twist Drill Grinders, and Grand Rapids Tap Grinders. The latest addition to the line is the Grand Rapids No. 65 Hydraulic Feed Surface Grinder, which is the largest machine of the line.

The No. 65 Machine has a table with a working surface of 12x48 in. The longitudinal and transverse movements enable the operator to cover the entire surface of the table with a 12x1-in. grinding wheel, which is standard equipment. The maximum distance from wheel to table under the full 2-in. wheel is 17 in.; vertical movement of the wheel head is 18 in. The machine is built around a heavy, rigid, one-piece column and base casting weighing approximately 3000 lbs. This construction guarantees maximum rigidity and permanence of alignment between the vertical head ways and the cross travel ways. The spindle head which is a very heavy casting, carries an extra-heavy spindle with a minimum overhang for the grinding wheel. The spindle operates in pre-loaded ball bearings. The machine is equipped with Vickers vane type hydraulic pump and relief valve. The pump, together with

the 3-h.p., 1200-r.p.m. motor to which it is directly connected, is mounted on the cover of the oil reservoir and enclosed within the column of the machine. It is conveniently accessible from either front or rear.

Provision is made for a maximum longitudinal speed of 125 ft. per minute, any desired speed up to the maximum being instantly available. The cross feed of the machine is automatically operated and may be set to operate at each reversal of the reciprocating table or at one end of the stroke only.

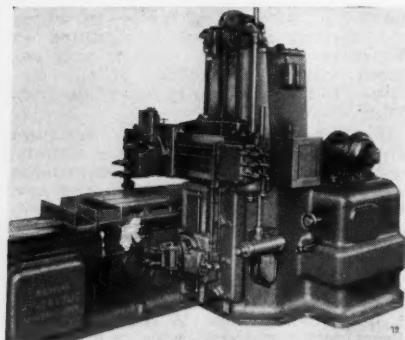
An interesting feature is the method of raising and lowering the wheel head. A large hand wheel is used, providing direct action through a worm and worm gear to the elevating mechanism, the adjustment being both accurate and rapid. The hand wheel is graduated in one-quarter thousandths. In grinding to close limits, a smaller hand wheel in the center of the large one is used which provides a back-gearred action to the elevating mechanism. Both the inner and outer wheels turn, but the graduations on the inner wheel are arranged to read on a moving pointer, giving a Vernier effect. This patented feature makes it easily possible to obtain readings of adjustments in tenths of a thousandth, with the ten thousandth graduations



Grand Rapids No. 65 Hydraulic Feed Surface Grinder

over  $\frac{1}{8}$  in. apart. A one-shot lubricating system is used by means of which all bearings and working surfaces are oiled by the operation of a single lever.

Two spindle speeds are available so



Rockford Hy-Draulic Shaper-Planer

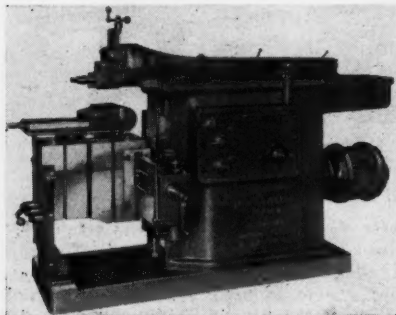
that work speeds can be maintained with worn wheels. The machine is equipped with a portable, self-contained coolant system of ample capacity. A self-contained motor driven dust collecting system of the machine tool type is also available.

## Rockford Machine Tool Company

Rockford, Ill.

### Booth No. 310, North Annex

Featured in this exhibit will be the Rockford Hy-Draulic Shaper and the Rockford Hy-Draulic Shaper-Planer shown in the illustrations. The machines are hydraulically-driven, the hydraulic mechanism being of the most modern type. The ram on the shaper and table on the shaper-planer are easily controlled for fast and positive action. The hydraulic power operates smoothly and positively, aiding in producing a smooth finish on the work.



Rockford Hy-Draulic Shaper

Speeds and feeds have a continuous range of changes between minimum and maximum. Reversal and quick, providing for the maximum number of strokes per minute. The smooth-flowing power with its cushioning effect lengthens tool life.

## Lincoln Electric Company

Cleveland, Ohio

### Booth No. E-310, Exhibition Hall

The latest developments in arc welding machines and electrodes will be demonstrated at this booth. The "Shield Arc" welder will be used with various Lincoln electrodes to demonstrate the welding of high manganese steel, high carbon steel, stainless steel, cast iron, aluminum and copper.

Two new, small, motor-generator type of arc welders, the SA75 and SA100, will be in operation welding sheet metal. Light gauge materials are welded with these small units as easily and with the same high quality results as those which are regularly obtained on the heavier plate with larger Lincoln machines. The latest type of automatic shielded metal arc welding machine will be in operation daily.

Two new electrodes, "Toolweld" and "Abrasoweld" will be shown. "Toolweld" provides savings up to 50 per cent in tool costs by refacing worn tools and making new tools of low cost. "Abrasoweld" builds up straight carbon steel, low alloy or high manganese surfaces to resist severe abrasion.

Also as part of the display will be the latest developments in electrode holder, electrode and motor cable, protective shields and goggles, gloves, leggings, brushes and supplies for automatic welding.

## Bryant Chucking Grinder Company

Springfield, Vt.

### Booth No. 203, North Annex

This company will have on display three machines: No. 4 Automatic, No. 24 Hydraulic and No. 24 Hydraulic Duty Internal Grinders. The first two are entirely new and the third machine has been redesigned to make possible greater production with finer accuracy on such work as aircraft cylinder bearing housings, pneumatic cylinders and so on. This machine will be in operation.

The No. 4 Bryant Automatic Grinder is especially designed for high production in grinding small diameter work in bearing rings, bushings, gears, and

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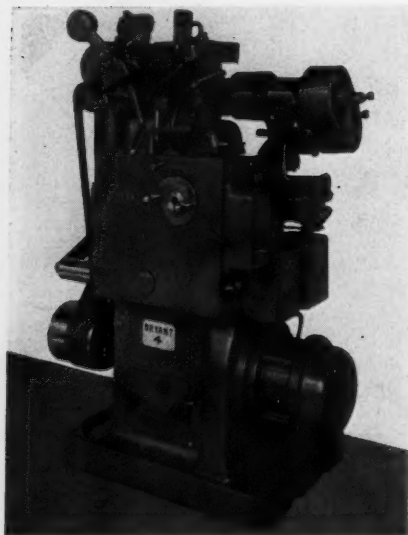
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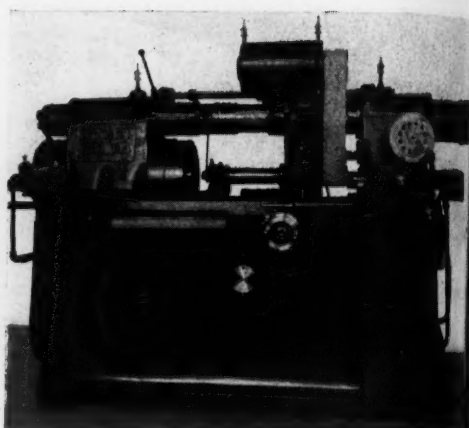
on. The rigidity of construction and the Bryant suspended wheel slide control permit the heaviest possible cuts on any size of hole within its chucking capacity. The Bryant principle of suspended wheel slide used in this machine combines simplicity of construction with ability to withstand hard usage at a minimum of upkeep expense.

The total chuck swing of the No. 4 grinder, without guard, is  $6\frac{1}{2}$ -in. diameter. The maximum wheel slide traverse is  $3\frac{3}{4}$  in. The crank traverse for the grinding stroke used on this machine provides a smooth and easy wheel control. It also makes possible a high rate of wheel slide traverse with a minimum of shock and vibration.

All movements to the wheel slide are controlled by one lever operated by the left hand, leaving the right hand free for handling the work. The use of compressed air for carrying the wheel slide in and out of working position is an important factor in maintaining the high production for which this machine is especially capable.



Bryant No. 4 Automatic Grinder



Bryant No. 16 Hydraulic Grinder

Automatic sizing on the No. 4 grinder is universal for blind, taper, and straight open holes. The grinding cycle is divided into four stages; chuck, rough grind, finish grind, and dress wheel. The order of operations may be changed as desired. Sizing is automatically controlled without attention from the operator.

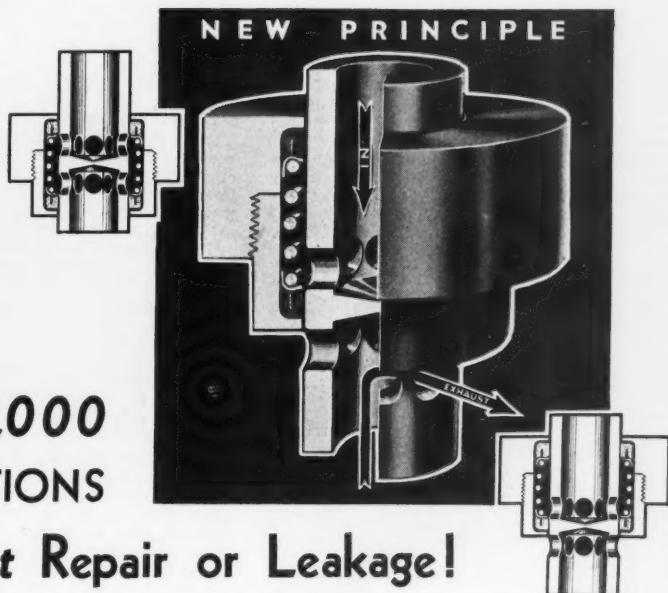
The Bryant Company is introducing for the first time a series of grinding machines—the No. 16—which are intended for the middle range of sizes. The capacity of the machine is 16-in. diameter, without guard, with  $15\frac{1}{4}$ -in. maximum wheel slide traverse. When designed primarily for holes up to 8 in. in length, the machine can handle holes up to 12 in. in length. The machine is equipped with full hydraulic control, utilizing the slide bar as a cylinder for the slide traverse. Hydraulics are also used for automatically operating the wheel truing device, cross feed, and lifting for quickly swinging the wheel slide into position for chucking.

### Pratt & Whitney Company

Hartford, Conn.

Booth No. 906, North Annex

Included in this exhibit is a Pratt & Whitney Jig Borer—to be known as the No. 2A—which has recently been developed. The new machine as designed not only carries the same basic principles which have previously been included in Pratt & Whitney Jig Borers, but it also contains many new features which are intended



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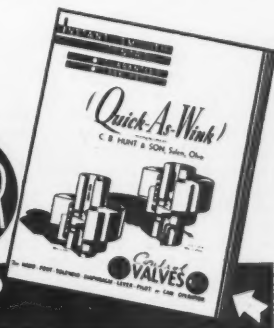
For any sort of control job—one of the four types of Quick-As-Wink valve units, in numerous combinations, is available for ANY requirement—giving wear free, leak-proof service and balanced operation which are inherent with Quick-As-Wink valves. Literally, the Q. A. W. principle guarantees millions of operations without repair or trouble. Among the Q. A. W. valve combinations—foot—hand—mechanical—solenoid—diaphragm—can be found a type of control suited to any need. Quick-acting—balanced—wear and trouble free—Q. A. W. outperforms any other type of control valve. Inquire about it.

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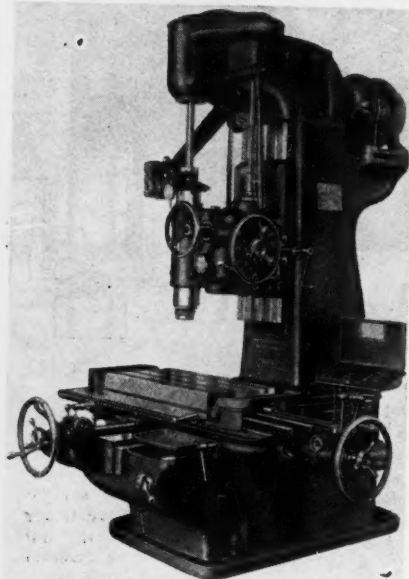
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to increase production. Among these features are: 12 spindle speeds ranging from 37 to 1800 r.p.m.; 8 spindle feeds in either direction ranging from 0.005 in. to 0.010 in. for each spindle speed; motor drive to spindle through hardened and ground helical gears; "shockless" insulated motor and spindle drive; hardened ground and lapped spindle quill; spindle mounted in permanently sealed ball bearings; depth dial indicator; built-in electric lights.

The Pratt & Whitney No. 2A Jig Borer



Pratt & Whitney No. 2A Jig Borer

is available in two sizes, the No. 2430 and No. 3644, the two machines being identical except for a difference in table sizes and work range. The No. 2430 machine has a table working surface of 16x30 in. and longitudinal and transverse table travels of 24 in. and 18 in. respectively. Both sizes have a spindle head travel on the face in the column of 12½ in. and a spindle quill travel of 9 in., with the spindle quill graduated in 16ths. The distance from the spindle center to the guide on the column face is 17½ inches.

The gear box contains two gear changes and a direct drive, which, in combination with the four speed motor, provide 12 spindle speeds ranging from

37 to 1800 r.p.m. The gears are of hardened and ground chrome vanadium steel and are extremely quiet in operation. Spindle speeds are connected by two levers, one of which extends from the gear box, while the other, which controls the motor, is located on the front of the bed. Power from the gear box is transferred to the spindle through chrome vanadium hardened spiral lapped bevel gears. The driving spindle is multi-splined at both ends, eliminating all strain on the spindle and quill.

The spindle head carries the spindle quill and power feed gear box, the latter obtaining its power from a sliding splined shaft connecting with the speed gear box. Eight power feeds are provided in either direction for any spindle speed. The hardened, ground and lapped spindle quill has a maximum vertical travel of 9 in. The weight of the spindle quill is offset by a heavy coil spring, which produces a balanced action.

Holes are located by two dimensions at right angles, using the two built-in measuring devices, one on each slide. The first hole is located under the spindle by whatever means is easiest, then the table is locked and the zero point for the whole job is established on the two dial indicators. This point does not change and can always be picked up again exactly by means of the indicators. Each slide has a trough extending from the anvil of the dial indicator to the adjustable end measure stop which moves with the table. In this trough are placed the necessary end measures for even inches and the inside micrometer by means of which inch fractions are obtained to a ten-thousandth.

To locate the next hole, the necessary end measures are inserted and the inside micrometers are properly set for the given dimension. The table is then moved until the dial indicators on the slides register the zero point. This locates the work exactly under the spindle, ready for boring the second hole. Any number of holes can be located, bored and checked in this manner.

Accessories available for use with the No. 2A Jig Borer includes boring heads, boring tools, boring bars, precision and mill reamers, stub gages, collets, proving bars, work locating indicators, cross line finders, parallel bars, drill chucks, spotting tools, center punches, scribing tools, precision angle irons, clamps, T-bolts, step blocks, tool cabinets, plain rotary tables and tilting rotary tables.

The No. 2430 machine requires a floor space 80x93 in. The net weight, including the motor is 7110 pounds.



August, 1935



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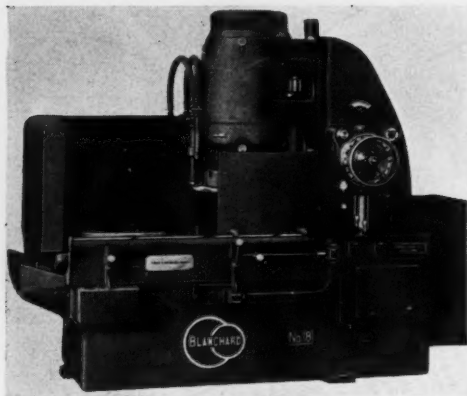
The No. 3644 machine requires floor space 104x93 in., and its weight, including the motor, is 8025 pounds.

## The Blanchard Machine Company

Cambridge, Mass.

Booth No. 309, North Annex

Included in this exhibit is the No. 18 Blanchard Surface Grinder, which is a new machine. The machine is similar in size to the No. 16 Blanchard Surface



Blanchard No. 18 Surface Grinder

Grinder but the design includes a number of new features which make the machine faster, more accurate, and easier to operate. Chief among the new features are; power traverse for chuck, lower chuck face for easier handling, increased rigidity of spindle, individual motor drives for the different functions of the machine, and wider range of speeds.

The machine carries an 18x5x15-in. grinding wheel and a magnetic chuck which may be 26, 30, or 36 in.-diameter, the work height under a new wheel being 12 in. in all cases. An oversize 20-in. wheel can be used and the work height may also be increased if desired.

The one-piece steel magnetic chuck is driven through a sliding gear box, making available six speeds from 6 to 33 r.p.m., power being supplied from a direct connected motor which is controlled by push button, eliminating the clutch. The feed hand wheel, which makes one turn for 0.025 in. feed, is imposed upon a dial which makes one turn for 0.100 in. feed. The dial carries

the feed trip and has a quick setting device by which it can be unlocked from the feed shaft and set to automatically trip at any amount of down feed less than 0.100 in. The lever which engages the feed also controls the rapid raising and lowering of the head and the two motions are interlocked.

The power traverse of the table is driven by a motor at the rear of the base and is automatically stopped at each end of the travel. The new type water guards, opening at the front near the operator, afford increased safety and effectively confine all splash and spray. All controls are grouped convenient to the operator and all motor starters and relays are in one cabinet at the back of the machine. The overall dimensions of the machine are: length, 9 ft., 3 in., width, 4 ft., 10 in., height minimum 6 ft., 11 in., maximum 7 ft., 7 in. Weight 11,000 pounds.

## The W. F. and John Barnes Company

Rockford, Ill.

Booth No. 304A, North Annex

Hydraulic fed units of modern design are shown in this exhibit. The advantages of correctly designed hydraulic feeds for actuating machine tool slides, the manner of which traverses may be speeded up, the cushioning effect on reversals, and the infinite number of changes in feed rate will be demonstrated.

Among the new units which will be on exhibition for the first time will be the Barnes Flange Type Unit shown in Fig. 1. This unit is especially designed for heavy boring and drilling operations and it may be adapted for manifolding direct to the cylinder or it may be piped direct to the valve and cylinder with a minimum of piping.

An indexing unit for hydraulically indexing a fixture in relation to the boring spindle is shown in Fig. 2. In this unit the hydraulic mechanism provides a positive means of actuating the indexing mechanism, at the same time providing a cushioning effect which adds to the life of the mechanism.

The Type FT Unit illustrated in Fig. 3 is used principally for the operation of boring and drilling heads. This unit is usually mounted on a bracket at the rear of the machine where it is controlled by a conveniently placed valve arranged according to the work to

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thumb-switch. And real Van Dorn quality from chuck to handle. See this new drill at your jobber's — and you'll say the price of \$19.50 is a miracle. Write for the complete new Van Dorn catalog. The Van Dorn Electric Tool Company, Towson, Md.

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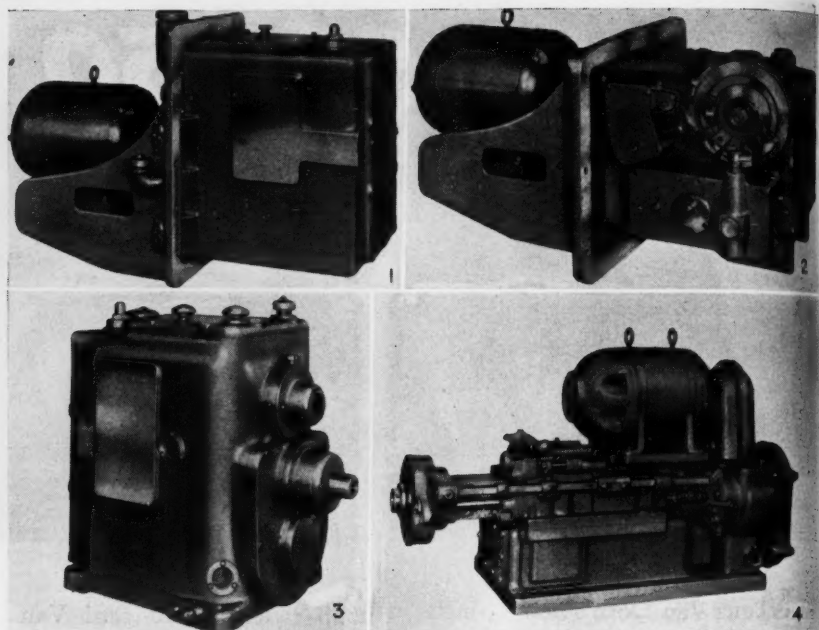


Fig. 1. Barnes Flange-Type Hydraulic Feed Unit. Fig. 2. Barnes Hydraulic Indexing Unit. Fig. 3. Barnes Type FT Unit for Operating Boring and Drilling Heads. Fig. 4. Barnes 3 HP Hydraulic Square Ram Unit

performed. This unit is of unusually compact and sturdy design.

The 3-h.p. Hydraulic Square Ram Unit shown in Fig. 4 was designed for a class of work that does not require the usual heavy duty hydraulic heads, and also to meet a demand for a Barnes Hydraulic Drill Unit which can be incorporated in existing machines or in machines of the manufacturer's own design. This drill unit can be operated in any desired position or at any angle, and can be operated in combination with independent or centralized control. The Square Ram Unit can also be furnished in 5 h.p. sizes.

The Barnes Hydraulic Feed as exemplified in these units provides rapid approach of tools to the work at a predetermined fixed rate and is easily adjusted to any desired feed rate between zero and the maximum for which the cycle is designed. An accurately-controlled dwell may be incorporated in the cycle if required, also rapid return of tools to starting position, automatic

stop, or repeat. With the smooth, uniform feed provided by hydraulic power, correctly-ground tools will not chatter. The above features are obtained through the use of two pumps and one control valve, all of which are of Barnes design and manufacture.

### Wiedemann Machine Company Philadelphia, Pa.

#### Booth No. E-313, Exhibition Hall

Among the various types of hand and power operated turret punches and other tools included in this exhibit are two machines that have not previously been presented to the public. These are the Type R-4P Motor Driven Deep Throat Turret Punch and the Type R-5 Heavy Duty Motor Driven Turret Punch.

The Type R-4P Turret Punch is a power driven machine for rapid, continuous duty. The machine can be supplied in three standard throat depths—18 in., 24 in., or 28 in., and with either

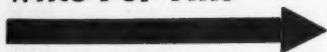
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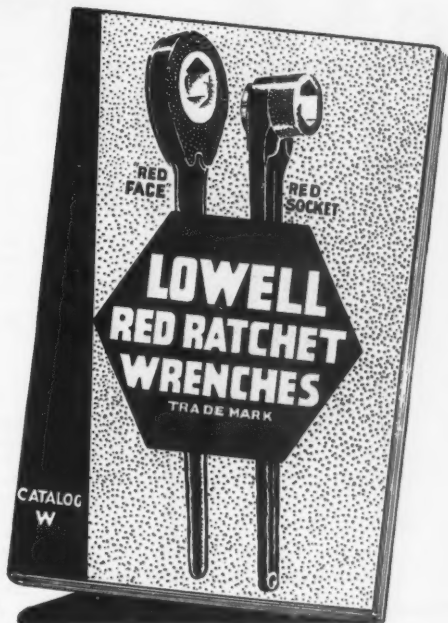
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8 or 12 stations. The machine as shown is furnished with 12 punches and dies up to  $1\frac{1}{4}$  in. diameter, mounted in a revolving turret. An accurate, positive indexing device locks the turret when the punch and die selected for use are located centrally under the ram.

The Type R-5 Punch has a throat depth of 18 in. and is built with a 12-station turret. The frame is of one piece Meehanite properly proportioned for the rated capacity of 80,000 lbs. The machine is driven by a 3-h.p. 1200-r.p.m., motor through V-belts and a ground worm and wormwheel enclosed and running in oil. The machine is both powerful and silent during operation. The clutch is of a special double face jaw construction with foot pedal control interlocked with the turret locking lever. All main bearings are cast integral with the frame and are bronze pushed. The worm and flywheel shaft is mounted on ball bearings.

Clutch control parts are separately enclosed in oil and the clutch will not repeat. However, the ram may easily be



Wiedemann Heavy Duty Motor Driven Turret Punch



Wiedemann Type R-4P Motor Driven Deep Throat Turret Punch

brought down by a hand wheel for spotting punches. Turrets, both upper and lower, are bored on a jig boring machine. The ram and punch holders are all made from heat treated chrome vanadium steel. Punches and dies are of high carbon steel, hardened and ground. The speed of the flywheel is 840 r.p.m., delivering 60 strokes per minute. Any standard 3-h.p. motor at 1200 r.p.m. can be used. The clearance between dies and strippers is  $\frac{5}{8}$  in. and the stroke of the machine is  $\frac{7}{8}$  inch.

### The Logansport Machine Company

Logansport, Ind.

Booth No. 313, North Annex

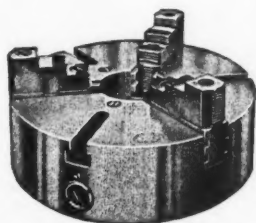
The above firm will exhibit a complete line of standard air and hydraulic equipment including arbor presses, chucks, cylinders, clamping devices, expanding mandrels, work ejectors, holding devices, milling and drilling fixtures, valves, and machine vises. The exhibit will also include special air and hydraulic equipment such as presses, drilling machines, line reaming machines, and assembly machines and devices.

Among the new items exhibited will be the "Logan" Hydraulic Forcing Press



BOOTH A-311 ARENA  
MACHINE TOOL SHOW

# Union Chucks



## EXTRA HEAVY DUTY CHUCKS

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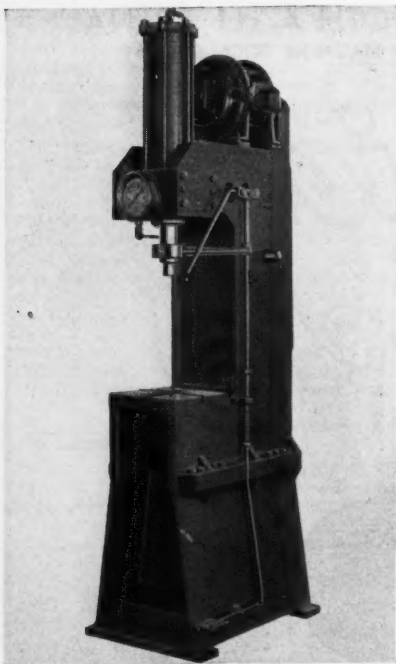
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**Logan Hydraulic Forcing Press**

of one to 50 ton capacity. This press is of all steel construction, electrically welded. The ram is of high carbon steel, hardened and ground, and operates in a long bronze bearing at the lower end of the cylinder, insuring positive alignment. The ram packings are self-adjusting and can easily be replaced when necessary.

The Logan Hydraulic Power Device is built into the column of the press frame, the column also serving as an oil reservoir. The pump and relief valve are mounted on a flanged panel which is easily removable. A variable pressure up to the maximum of the machine is available. The pressure exerted by the ram is indicated by a direct reading pressure gauge. Press control is by hand or foot pedal, release of either permitting the ram to return to top position. Adjustable stops can be set to automatically regulate the stroke.

A coolant pump and pan can be provided for the press when used for broaching operations. Tables of various heights and designs can be furnished as required.

## **The Charles L. Jarvis Company**

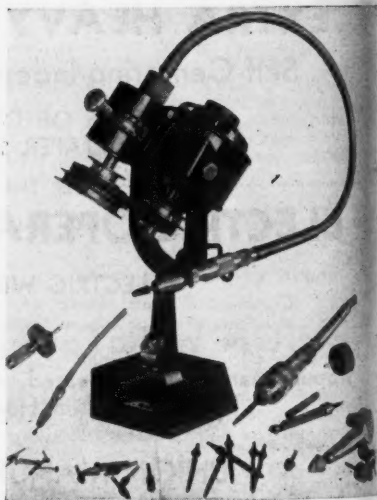
Gildersleeve, Conn.

**Booth No. E-203, Exhibition Hall**

The complete line of Biax flexible shaft machines, flexible shafts, screw driving units, and tapping attachments made by this firm will be on display, also a complete line of new rotary files. The files are of high speed steel and are made with the flutes ground in solid hardened blanks.

Biax flexible shafts, encased in rubber vulcanized steel casings, are used with the flexible shaft machines. Power is supplied by repulsion-induction motors, driving through ball bearing, self-tightening countershafts, to which power is transmitted by moulded V-type belts. Units of various sizes and speeds are available with floor stands, in bench models, as shown, or with an overhead trolley consisting of Monorail of suitable size and design best adapted for the job for which it is to be used.

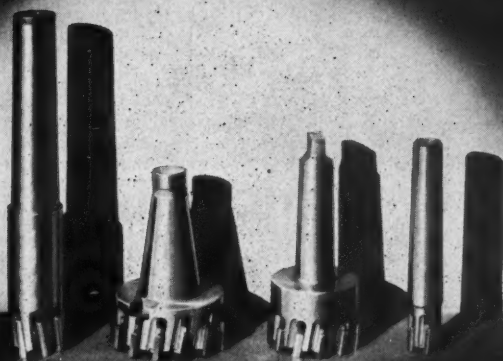
Biax tappers are equipped with ball bearings, and the clutches, which are of Textolite, are of the self-adjusting friction type. The reverse is double-speed and double-friction. All gears are of chrome nickel steel, hardened and ground. Housings are of cast Dia-lyte. The tappers are equipped with Jacobs



**Biax Flexible Shaft Machine.**

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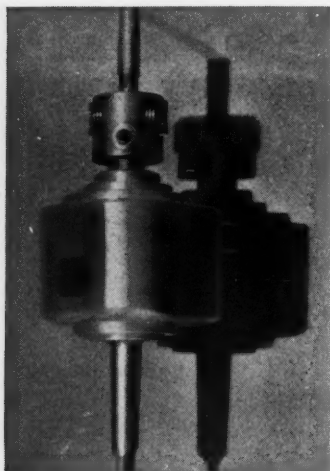
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Biax Tapping Attachment

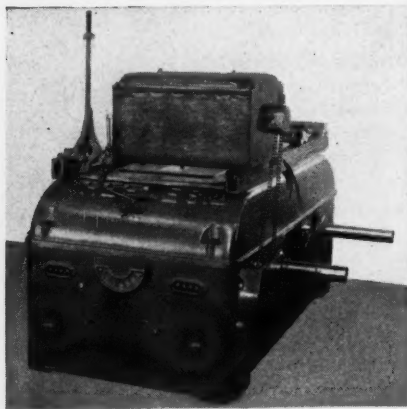
"double-grip" chucks which hold the taps by the square as well as by the shank.

### Reeves Pulley Company

Columbus, Ind.

#### Booth No. E-209, Exhibition Hall

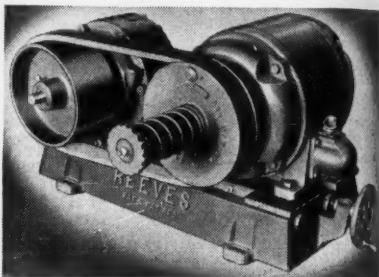
Recent developments in the well-known Reeves line of various speed transmissions are included in this exhibit. One of the outstanding features



Reeves Hydraumatic Control

of the exhibit is a new hydraulic control for automatic variable speed regulation known as the Reeves "Hydraumatic" Control. This control was originally developed to meet a demand for a control which would operate from a very slight pressure on the indicating lever and eliminate "hunting" action. It has since, however, been included in the line of standard Reeves controls.

The Hydraumatic Control is so sensitive that a pressure of only two or three ounces, moving the extended lever a small fraction of an inch, will produce the desired variation in speed. The Control is actuated by an indicating lever attached by cable, arm, link, or chain to a compensating or floating roll, pressure regulator, float, moving part of machine or any other element from which indication of the required speed can be taken. In the Hydraumatic Control this lever is attached to one of the shifting levers of the transmission

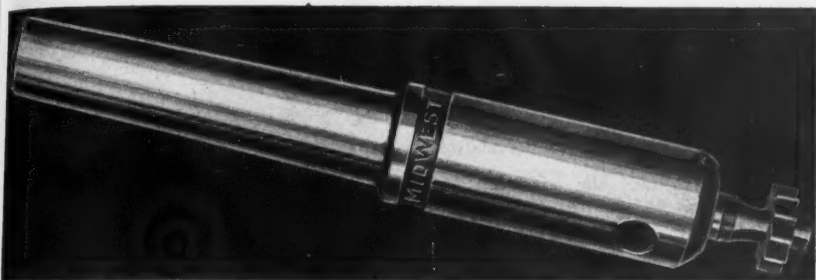


Reeves Motor Base for mounting gear reducer in connection with Vari-Speed Motor Pulley

through a differential mechanism and vertical and horizontal rods. Thus movement in lateral direction of the indicating lever is transmitted to the shifting levers which vary the diameters of the discs and V-belt, increasing or decreasing speed on the variable speed shaft of the transmission and hence on the driven machine.

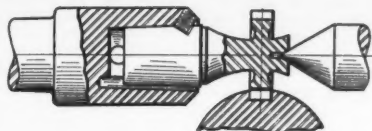
All operating parts of the control except the driving motor are housed in a dust-proof cast iron enclosure on a special mounting above the transmission. The motor, which is either A. C. or D. C. and of varying horse power capacity according to the size of control, operates a geared pump through a sprocket and roller chain. Oil is taken up through a suction pipe by the geared pump and is forced under pressure through a pipe into a two-way valve

## POSITIVE DRIVE AND EXTRA SUPPORT



## MIDWEST KEYWAY CUTTERS and HOLDERS

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Extended center permits supporting cutter at both ends as shown in line drawing.

Advantages of Midwest's exclusive, tested Taper and Pin Drive are being discovered daily by an increasing number of enthusiastic users.

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- Greater Rigidity
- Elimination of chatter
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- Faster feeds
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- Low initial cost

All standard sizes of Midwest Keyway Cutters have same size shank and are interchangeable in all sizes of Midwest Holders.



New No. 14-M Midwest Catalog gives full details of Midwest Keyway Cutters & Holders. Also Midwest interchangeable counterbores, back spot facers, end mills, core drills, two-diameter drills, expansion reamers, extension holders, flat and circular form tools, cemented tungsten carbide tools, and a complete line of solid milling cutters of modern design. Send for free and postpaid copy.

## Midwest Tool & Mfg. Co.

2360 W. Jefferson Ave.

Detroit, Mich.

where it is controlled to increase or decrease the transmission speed by means of an extended lever. When the desired speed is reached, it is automatically held at that point.

Included in the exhibit is a new type of motor base for mounting a gear reducer in connection with the Reeves Vari-Speed Motor Pulley, making it possible to mount these two units on a common base and thus permitting the Vari-Speed Motor Pulley to drive direct to the reducer.

The unit utilizes the standard stationary base of the Reeves Motor Pulley Countershaft Unit, but in place of the countershaft is a sliding base of the same type as that on which the motor pulley itself is mounted and on which the gear reducer is placed. This base is firmly bolted to the stationary base, but can be adjusted as required by the size of the reducer.

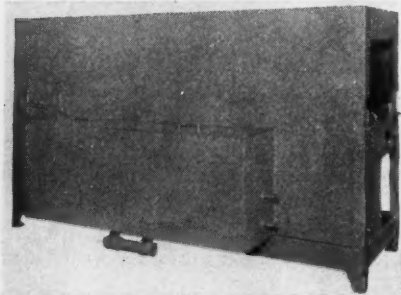
Any standard make of reducer within the limitations imposed by the size of the base can be used and, of course, the reductions available depend upon the ratio of the reducer. The base is available for all standard sizes of the Reeves Motor Pulley Unit.

### Colt's Patent Fire Arms Mfg. Co.

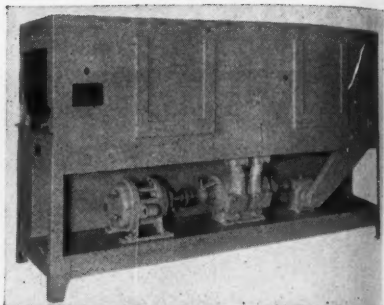
Hartford, Conn.

#### Booth No. E-210, Exhibition Hall

A display of Colt "Autosan" Cleaning and Drying Equipment, consisting of two machines, will be on exhibition at this booth. One is the Colt Autosan Model MR-8 which is a standard washing and rinsing unit designed to thoroughly clean a wide variety of parts. Parts are placed on a wire mesh conveyor upon which they are automatically carried into the powerful washing and rins-



Colt Autosan Model MR-8 Washing and Rinsing Machine



Colt Autosan Model 270 Revolving Type Dryer

ing sprays. The machine is equipped with two extended tanks, each having perforated scrap trays which are easily removed for emptying. Twelve tubes are provided, three above and three below in both the washing chamber and the rinsing chamber. All tubes are easily removed for cleaning without the use of tools. The machine can be furnished with several types of conveyor, depending upon the type of work to be cleaned.

The Colt Autosan Model 270 Revolving Type Dryer is a unit that is being used in many large industrial plants. Parts are carried through this unit by means of a revolving drum with internal fixed spiral and are continuously subjected to blasts of circulating hot air. The Model 270 Dryer can be used in connection with Colt Autosan washing units or as a separate dryer.

### E. F. Houghton & Co.

Philadelphia, Pa.

#### Booth No. E-204, Exhibition Hall

This exhibit will include three features, as follows: (1) a competitive exhibit of "Vim-Tred" leather belting, (2) a motion display of charts, graphs, and pictures which will visualize the properties and advantages of Houghton's Extreme Pressure Straight Cutting Oil, and (3) a lighted display of samples of lubricants, together with a Cornell Testing Machine on which tests will be made of Houghton Extreme Pressure Industrial Lubricants to stress the points of high film strength and load-carrying capacity.

Other items on exhibition will include a display of leather packings, parts that have been heat treated with Houghton's Perlitol Liquid Carburizer and enlarged photographs of noteworthy tests or operations using Houghton's materials.

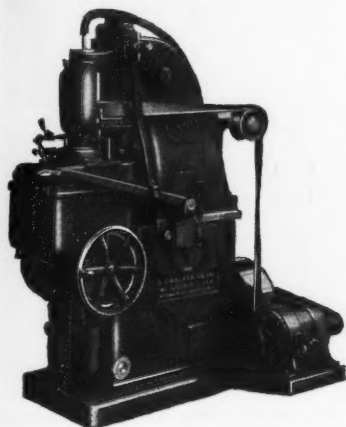


## O. S. Walker Co., Inc.

Worcester, Mass.

### Booth No. 3, North Hall

This exhibit will include a Walker Single Stroke Surface Grinding Machine, Model D-B, a No. 617 Standard Type Rectangular Chuck, Universal Swivelling Magnetic Chuck, Toolroom Magnetic Chuck with Duplex Base, No. 618 Rectangular Magnetic Chuck, No. 1134 Rectangular Magnetic Chuck, No. 617 Bar



Walker Model D-B Single Stroke Surface Grinding Machine

Pole Face Rectangular Magnetic Chuck, Walker Standard Rotary Type Chuck and a new 10½x10½x78-in. Swivelling Magnetic Chuck with Central Control.

The new Swivelling Magnetic Chuck can be rotated 90 degrees for retruing the top faces of machine knives and to intermediate angles for grinding the bevels. Both faces have T-slots for locating or clamping work, if necessary. The magnetic surface on the face of the chuck is 7¼ in. wide and the top face is 6¾ in. wide, the magnetic surface being uninterrupted over the edge of the chuck for the entire length of 14 inches.

The chuck is of triangular cross section and all-steel construction, aside from the bearings and central control unit, the end bearings having bronze sleeves

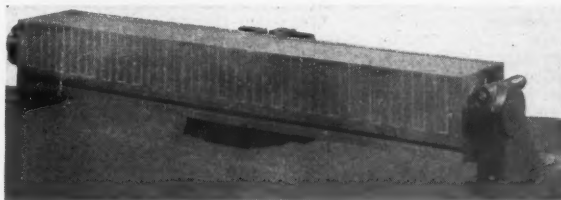
and pillow blocks having end caps and felt wipers to prevent the water entering the bearings.

The chuck is rotated by means of a handwheel (not shown) which actuates a vertical shaft that carries a steel worm. The worm engages with a bronze ring gear segment attached to the back of the chuck. This central control is protected from water and grit by a canvas guard attached to the back of the chuck and which can be placed over the unit when the handwheel is removed.

The chuck is of the MC type, the coils being located on 6¼ in. centers. Chucks of this type can be built in single units up to 10 ft. in length. Above 10 ft. they are built in three units, the center section being 77 in. long and the end sections being of equal length. The three sections are welded together with a continuous backplate which makes the chuck a single unit, thus providing an unbroken magnetic surface throughout the length of the chuck face.

In addition to being exceptionally strong magnetically on both faces, the chuck has the advantage of holding work uniformly along the edge for bevelling—a desirable feature where thin knives are being ground. The type of construction used is also available for non-rotating units, the chuck then being mounted on angle supports. Chucks used in fixed positions can be built in independent units and the proper alignment obtained through location of the supporting angles.

The Walker Model D-B Single Stroke Surface Grinding Machine is designed to provide ample power, rigidity, and accuracy for high production and at the



Walker Swivelling Magnetic Chuck with Central Control

same time provide quick adjustments for dealing with the wide range of work for which the machine is adapted. The grinding wheel head can be moved longitudinally a distance of 4 in. to or from the center of the work table, and

the table can be tilted through an arc of 7 degrees, making possible the grinding of work with hubs up to 6 in. diameter.

Work to be ground is placed on the chuck, then the wheel head is lowered, which automatically closes the electric circuit, magnetizes the chuck, and operates a clutch which starts rotation of the chuck. When the grinding operation is completed, the raising of the wheel head automatically stops the chuck rotation, breaks the electric circuit through the chuck, and for an instant closes the circuit through the chuck in the opposite direction, thereby demagnetizing the chuck face and facilitating removal of the work.

The machine is motor driven, power being transmitted through sprockets and a silent chain. This drive insures a constant speed of the grinding wheel. The motor should be either  $7\frac{1}{2}$  h.p. or 10 h.p., 1750 r.p.m. The chuck is a Walker No. 12 R Rotary Magnetic Chuck with either style B or style D faceplate, depending upon the size and thickness of the work. The grinding wheel is cup-shaped, 8-in. diameter,  $5\frac{1}{2}$ -in. hole,  $\frac{3}{8}$ -in. rim, and 3 in. deep.

The grinding wheel is centered in a cast iron mount and held in place by a bronze ring and 4 screws. The wheel head weighs approximately 400 lbs. and is accurately counter-balanced. The grinding wheel spindle, which is of machine steel, carries on its lower end a faceplate to which the grinding wheel mount is attached. The lower end of the spindle is carried in pre-loaded ball bearings thereby eliminating vibration in operation. The normal spindle speed is 2000 r.p.m.

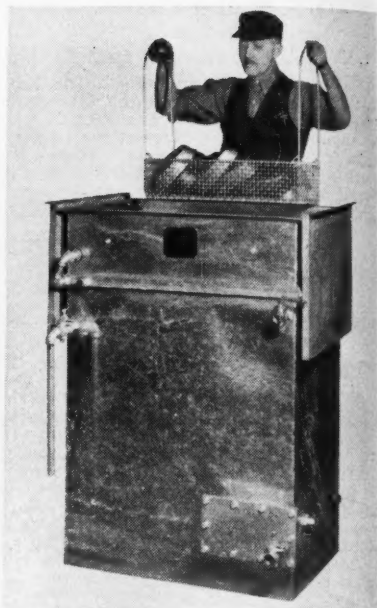
The machine will handle work up to 12-in. diameter and 4 in. high under a new wheel. The work table is a 12-in. diameter Walker Rotary Magnetic Chuck with  $1\frac{1}{2}$ -in. center hole. It is wound for 110 or 220 volts d. c., power required being 110 watts. The work table can be operated at 6 speeds: 60, 100, 170, 110, 185, and 310 r.p.m. The wheel head travel is 5 in. and the work table operates through a range of 4 in. Floor space required is  $61\frac{1}{2} \times 68$  in. and the net weight without motor is 5000 pounds.

### G. S. Blakeslee & Co.

Chicago, Ill.

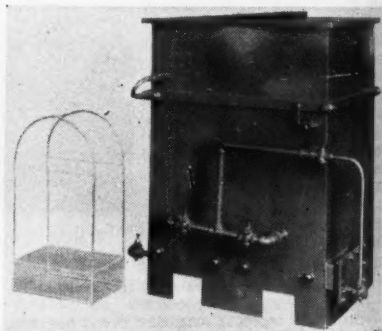
#### Booth No. E-202, Exhibition Hall

Washing and degreasing machines for cleaning oil, grease, dirt, chips, and so on from stamped and machined parts



The Blakeslee Standard No. 2 Vapor Degreaser

are featured in this exhibit. The Blakeslee Standard No. 2 Liquid Vapor Degreaser uses a solvent consisting of a chlorinated hydro-carbon known as "Blacosolv," especially prepared with inhibitors to keep the degreasing solution stable during the degreasing process.

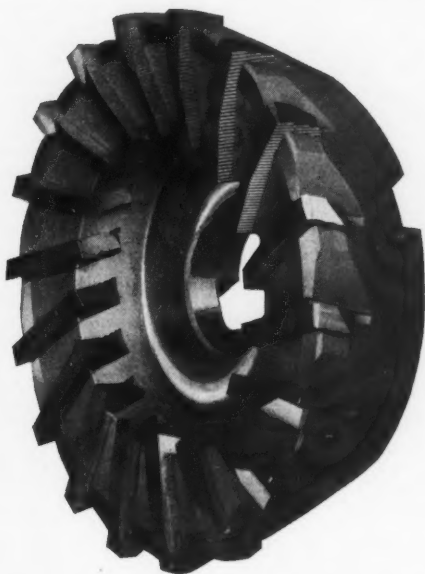


The Blakeslee Standard No. 2 Liquid Vapor Degreaser

**50%** of the blade is  
ACTUALLY USABLE IN

**G & G**

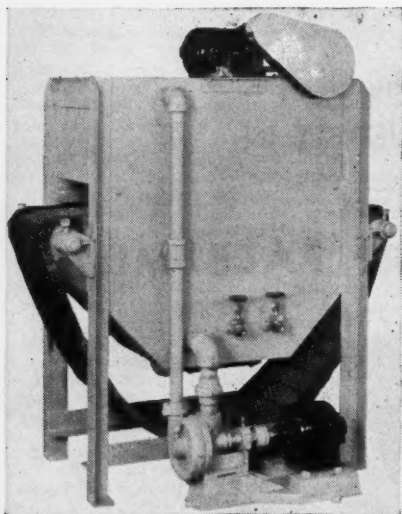
## **INSIDE CONE TYPE FACE MILLS**



Designed to provide grinding life on O. D. and side faces in the proper ratio.

At each adjustment the blade moves .060" radially and .010" sideways. Isn't that your **CORRECT** grinding ratio for roughing face mills?

**GODDARD & GODDARD**  
DETROIT, MICH.



The Blakeslee No. 50 Niagara Single Tank Pump Type Washing Machine

The machine is provided with heating and condensing coils and means of controlling the height of the vapors. To operate, the parts are placed on hooks or in basket containers and positioned in the liquid compartment where the excessive grease and dirt is removed. They are then immersed in the vapor rinse where they remain until condensation ceases. When withdrawn from the machine they are chemically clean and dry.

The Blakeslee Standard No. 2 Vapor Degreaser degreases parts by the vapor method only. The machine is fully equipped with heating coils, gas burner, or electrical units as necessary. Equipment is included for controlling the height of vapors. This machine will degrease 1250 pounds of miscellaneous articles per hour.

The Blakeslee No. 50 Niagara Single Tank Pump Type Washing Machine is built with outside and under combination wire-covered power-driven conveyor. Parts are washed in this machine by placing them in baskets on the conveyor which automatically conveys them through the machine. Washing is accomplished by sprays located above and below the conveyor. This machine is one of the smallest type metal washers made by this firm.

## Hannifin Manufacturing Co.

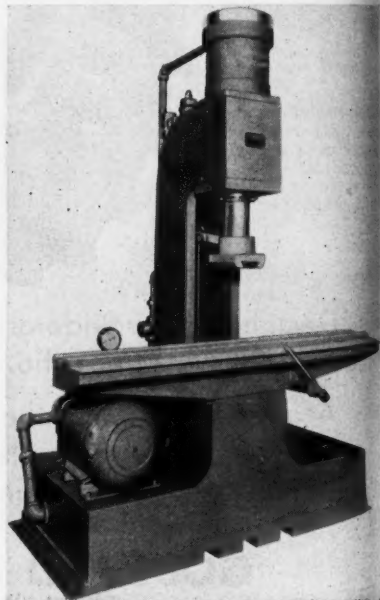
Chicago, Ill.

### Booth No. 104, North Annex

Among the hydraulic and air-operated equipment exhibited at this booth are the Hannifin Sensitive Straightening Press and the Hannifin Air-Operated Moulding Press, both of which are entirely new.

The Sensitive Straightening Press is a 35-ton hydraulic press especially designed for straightening operations on axle shafts, crankshafts, and similar work requiring accurate straightening. Simplified handling and increased production are features of the design of the control mechanism. A single lever controls the entire movement of the ram. When moved in either direction the ram will move a proportional distance, and is then stopped by bringing the operating valve to neutral. Thus a pressure of 35 tons is obtained through the exact distance required to straighten the work. An accurate ram movement, either up or down, of as little as  $\frac{1}{16}$  in. may be obtained.

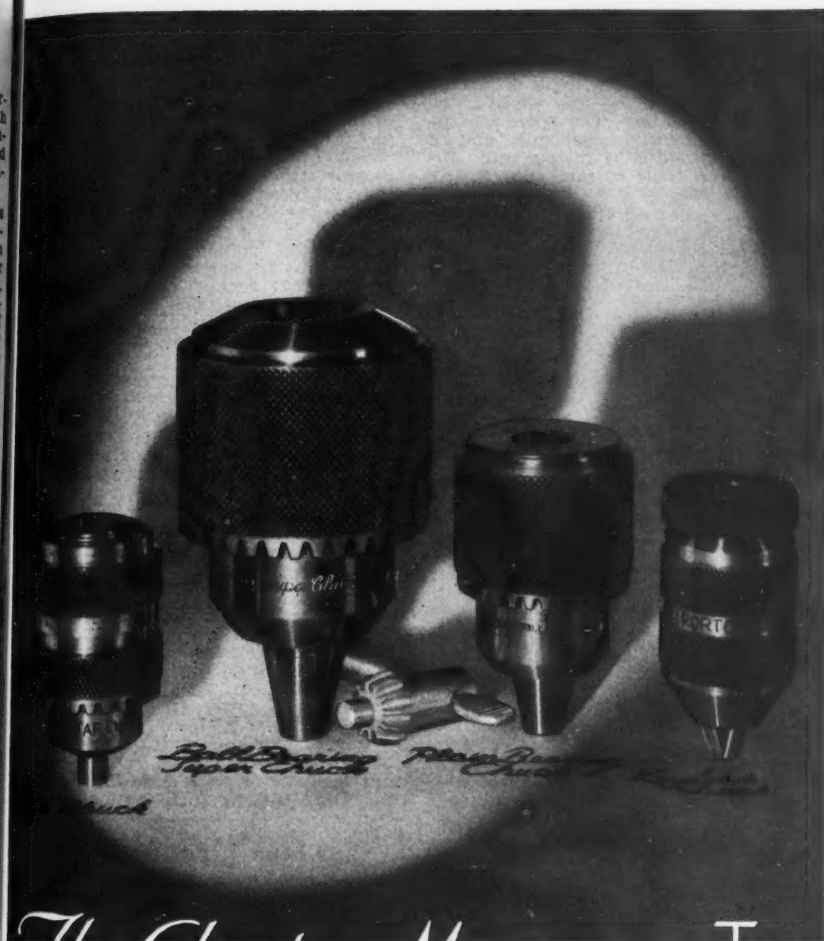
The hydraulic power unit, with con-



Hannifin Sensitive Straightening Press

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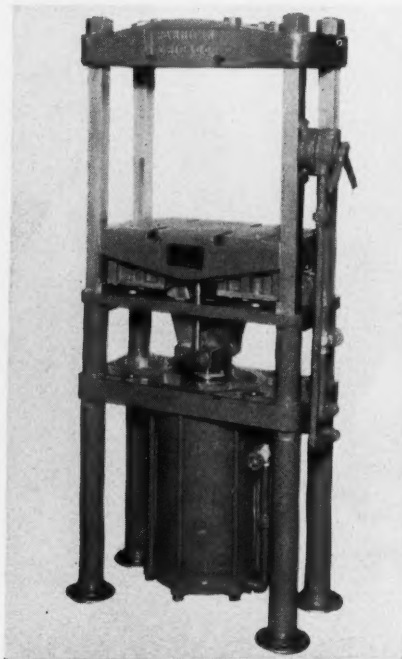
## *The Chuck is Master* OF THE TOOL

Tools such as drills, reamers and taps are now at the highest point of perfection in their history—thanks to metal science and modern methods. Give the tools a fair chance and they will do everything their makers claim. This chance starts at the chuck—the CHUCK IS MASTER OF THE TOOL. Upon the accuracy of the chuck, its gripping power, its speed of operation, its ability to take abuse depends the efficiency of a good tool.

JACOBS CHUCKS are better today than ever before. They match in improvements and refinements the tools they hold and the machines that drive them. Give the tools a chance—specify Jacobs.

**THE JACOBS MANUFACTURING CO., HARTFORD, CONNECTICUT**

stant delivery type rotary pump, is built into the base of the press, making a self-contained unit that requires approximately 19 ft. of floor space. The ram may be fitted with any type of fixture required for handling the work. The ram stroke is 6 in. The speed of the power stroke is 53 in. per min. and of the return stroke is 77 in. per min. Dimensions are: table to ram (up) 20 in.;



**Hannifin Air-Operated Molding Press**

center of ram to face of frame, 9 in.; length of table, 70 in.; floor to table, 36 in.; overall height, 98 in.; base, 38½ x 69 inches.

The Hannifin Air-Operated Moulding Press is a compact 18-ton capacity air-operated platen press for plastics and rubber moulding operations. The advance stroke is six times the pressing stroke, the advance stroke being 5½ in. at 6,000 lb. pressure and the pressing stroke being 1½ in. at 30,000 pounds. This cycle of operation permits rapid production, and one operator is enabled to handle the steady production of several presses.

This press is used for both hot and cold molding, rubber molding, and several types of special molding operations. Speeds on pressures may be regulated to suit individual requirements. An especially valuable feature of this press in plastic molding work is the provision for the use of maximum pressure to "break" or separate the molds on the reverse stroke after the pressing operation has been completed. An air cushion at the end of the stroke prevents shock.

The press is compact and comparatively light in weight. Use of the shop air supply makes special hydraulic equipment unnecessary. The press platen is 17x14 in.; dimension between columns, 22 in.; platen down, 17¼ in.; platen up, 10½ in. Capacity of the press is 15 tons at an air pressure of 80 pounds per square inch and 18 tons at 100 pounds pressure per square inch. The same press inverted is available for bench mounting.

### **George Gorton Machine Co.**

Racine, Wis.

#### **Booth No. H, Arcade**

This exhibit will consist of the following machines: No. 9-J Gorton Super-Speed Vertical Milling Machine, No. 8½-D Gorton Die Duplicator, No. 8-D Gorton Super-Speed Vertical Milling Machine, No. 8-D Gorton Universal Milling Machine, No. 3-Z Gorton Pantograph Machine, No. 3-U Gorton Pantograph Machine, No. 3-K Gorton Cutter Grinder, No. 375-1 Gorton Cutter Grinder, No. 215-1 Gorton Circular Table. Numerous samples of work produced by these machines will be included.

### **The Leon J. Barrett Company**

Worcester, Mach.

#### **Booth No. A-408, Arena**

Three centrifugal machines will be included in this exhibit; a No. 1200 Oil Extractor, a No. 251-J Filwhirl Enameler, and a Grafton-type Size O Machine.

The No. 1200 Oil Extractor is of the latest Barrett design with Barrett safety features and is directly driven by a built-in motor. It has a capacity of 66 cubic ft. per hour of oil-free chips. It will be shown with an air hoist for lifting the chip-laden containers in and out of the extractor. The hoist operates on air pressures of from 50 to 80 lbs. per square in.; however, it may also be operated hydraulically.

A No. 251-J Filwhirl Enameler of the latest model will be shown for the first

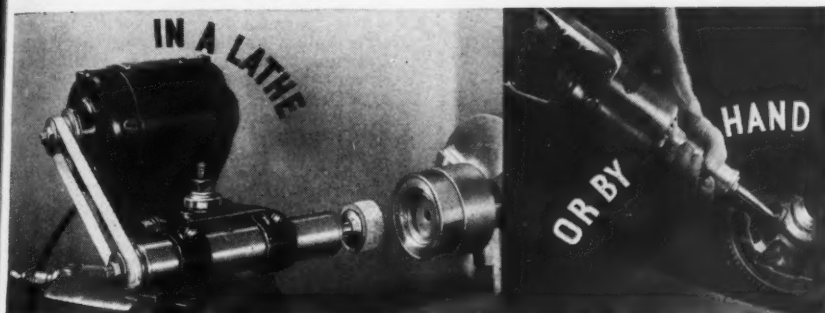
"A tool on it western divider we now

Dumors has co you ar

The Dr Racine Please Name Firm City Our I



# BETTER? YES! FASTER? YES! CHEAPER? YES!



*On this forming die, accurate diameter and depths were obtained in one set-up by using a Dumore No. 5 Grinder with a cup wheel.*

*A Dumore No. 9-HG touching up a radius. Extension spindles get into tight places.*

"A tool room or machine shop today can't hope to keep pace with the present day demands on it without modern grinding tools," says the foreman of an aggressive shop in a mid-western city. "I bought our first Dumore lathe grinder 15 years ago. It started paying dividends at once—we were able to turn out better work, faster and cheaper. As a result we now have two lathe grinders and a No. 9 hand grinder."

Dumore pioneered the high speed grinder for precision tool room and production work—has contributed the most important of the refinements and developments in this field. If you are looking for new ways to reduce grinding costs—and to step up each man's capacity and improve the quality of his work, investigate the Dumore line. Just mail the coupon below.

## DUMORE

MAIL THIS COUPON FOR GRINDING FACTS

The Dumore Co., Dept. 185-H  
Racine, Wisconsin.

Please send Catalog of Dumore Precision Grinders.

Name ..... Title.....

Firm .....

City ..... State.....

Our Industrial Distributor's Name Is.....

### DO YOU KNOW

that the Dumore Co. is one of the country's leading manufacturers of PRECISION built fractional h.p. (series wound) motors? Dumore engineers have had 22 years experience in designing and adapting power units.



**No. 251-J Filwhirl Enameler**

time with samples of its work. With it will be a hand operated chain hoist and a pump and tank unit for the storage and handling of the enamel.

The Grafton-type Machine is arranged as a dryer and is shown with a heater grid. This machine is designed to wash and dry small parts, particularly those encountered in the manufacture of watches, clocks and instruments. It is also adaptable as a laboratory machine.

### **Gould & Eberhardt**

Newark, N. J.

Booth No. E, Arcade

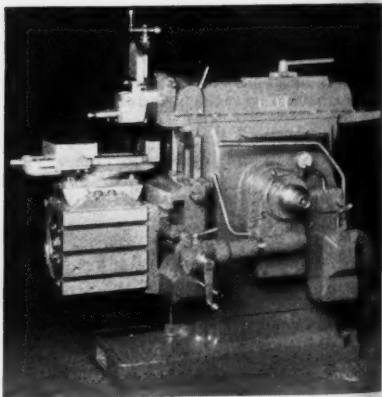
Two new machines will be included in this exhibit; a G & E 14-in. Plain Tool Room Universal Shaper and a No. 72-H Universal Manufacturing-Type Gear Hobbing Machine. The new Tool Room Universal Shaper was designed especially for tool room die work and for shaper work of the smaller type where speed and accuracy are prime requisites. As shown, the shaper is equipped with a swivelling table having a tilted top. Convenience is the feature of the machine, as evidenced by the low working height and concentration of controls without sacrifice of range or cutting ability.

The shaper is made in 14-in. and 16-in. sizes, to operate from 12 to 165

strokes per minute and 15 to 200 strokes per minute depending upon the size of the machine. Rapid power traverse makes it possible to move the table rapidly in either direction. Automatic cross feed to the table is actuated by a single cam synchronized with the return stroke of the ram. Sixteen changes of feed from 0.006 to 0.100 in. are available. Feed changes and direction are indicated on a direct reading feed dial. The Standard G & E Cranking Gear Transmission is employed, in which all of the main internal transmission gears are of the helical type.

The transmission gears slide on multiple spline shafts mounted on Timken Bearings. The motor drive arrangement is very compact with a direct connected drive of either chain, multiple V-belt, or gears. Adequate lubrication is assured by a circulatory pressure system, oil being forced under pressure directly from the pump to the ram guide ways and the entire linkage system, including the main crank block and linkage pins. Cascade oiling is provided for the main internal transmission.

The G & E No. 72-H Universal Manufacturing-Type Gear Hobbing Machine was especially developed for the accurate and rapid production of spur gears, single and double helical gears, and worm gears. The machine has capacity to cut gears up to 48-in. diameter with the support removed. The face capacity for spur gears is 20 in. and rated pitch



**G & E Plain Tool Room Universal Shaper**

capacity is 1½ D.P. in steel. The net weight of the machine is 26,000 pounds.

Characteristic of all G & E Manufacturing Gear Hobbing Machines, this new



# TOOLS

**Like "G" Men are the Means to an End . . . the Circumvention of the Undesirable.**

● Inaccuracy, excessive wear, delay—the costly undesirables of industry can be controlled by the use of cutting tools with a dependable reputation.

● Cogsdill tools are the result of constant vigilance dedicated to the accomplishment of definite improvement.

**BLACK PANTHER TWIST DRILLS  
HEAVY DUTY REAMERS  
COGSDILL CENTERDRILLS  
END MILLS, BLADES, BORING**

Tools and custom designed special tools have won the confidence of a wide circle of Industries' Leaders and are the accepted measure of Cutting Tool quality.

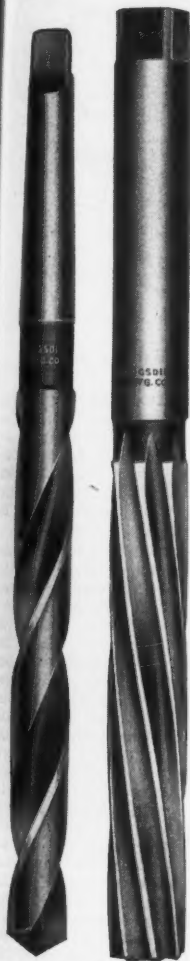
**"Q" TOOLS IF YOU PLEASE.**

**COGSDILL MFG. CO., Inc.**

**TWIST DRILLS, CENTER DRILLS, MACHINE REAMERS  
AND SPECIAL CUTTING TOOLS**

Serving the Leaders of Industry for 21 Years

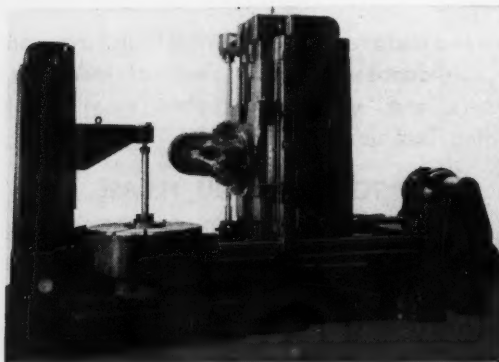
**DETROIT, MICHIGAN, U. S. A.**



universal type machine is designed upon the vertical cutting principle with the hob slide mounted on an adjustable stanchion and with the work spindle located within the base of the machine. The hob slide travels on double rectangular slides having four independent adjustments. The stanchion is adjusted along the base for the depth of tooth and diameter of gear to be cut. The swivelling cutter support may be adjusted 180 deg. for cutting left and right hand helical gears.

The hob spindle, which is of ample proportions, is of new and radial design. A bronze tapered sleeve is shrunk onto the alloy steel, heat treated spindle and rotates within the hardened steel tapered ground bushing. This construction retains the co-axial rotative center of the shaper spindle within its bearing.

Power rapid traverse is provided to move the hob slide rapidly in either direction and is also available to move the stanchion in either direction. A differential mechanism for cutting helical gears is built directly in the machine to correlate the work rotating and cutter feed mechanisms. An automatic infeed mechanism is incorporated for automatically hobbing single and multiple thread worm gears by the infeed method of cutting. Another outstanding feature is the index worm and gear adjustment whereby the original center distance of the main drive worm and gear is retained at all times. A complete circulatory pressure system automatically and continuously supplies oil to all important moving parts. The machine is regularly motor driven through multiple V-belt or silent chain connection. All controls are easily accessible.

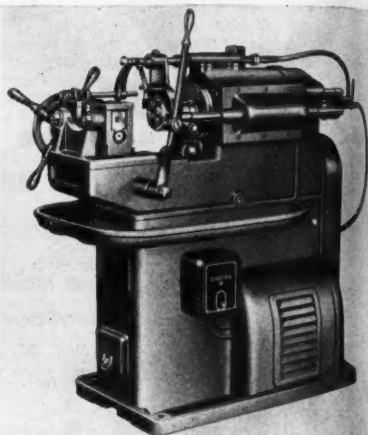


G & E No. 72-H Universal Hobber

## The Geometric Tool Company New Haven, Connecticut

Booth No. 103, North Annex

The Geometric exhibit includes a new threading machine—the No. 12—in the design of which are many radical im-

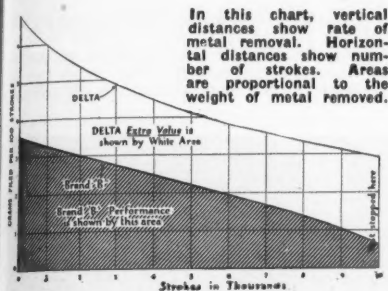


Geometric No. 12 Threading Machine

provements. While designed for hand operation for general purpose work, the machine is big and sturdy with convenient operating levers for rapid production. The machine may be equipped with or without a lead screw, at the option of the user. As standard, it is furnished without a lead screw.

An unusual feature of this machine is that the spindle carrying the die head advances onto the work, which is stationary. The spindle, which is hardened and ground, slides in a quill which is mounted on large taper roller bearings. Power is transmitted from the quill to the spindle by means of a spider, the trunnions of which are mounted in large ball bearings. This construction provides a sensitive sliding action and prevents drag on the threads being cut. Travel of the spindle is 45 inches. Although the machine does not come equipped with a work holding device, the standard Geometric-Screw-Type standard vise may be mounted on a carriage. This vise is

# Delta Files Save TIME



Even when filing is incidental, Delta Files save money by enabling the workman to spend more time on the main job and finish it sooner.

The time thus gained by faster filing is too great to be overlooked. Multiply a possible ten seconds each time a file is used by hundreds of times each day, and the saving goes beyond any question of file cost.

But Deltas reduce the monthly file bill as well. They outlast ordinary files as much as they outcut them.

The chart shows why. Six Deltas and six of another high-grade brand, all 14-in. flat bastards, were tested 10,000 strokes in the Duplex Testing Machine under exactly equal conditions.\* The curves show average results. At 7,000 strokes the Brand "B" files were not worth using further. To that point, the Deltas had removed 80 percent more metal. They were still cutting as fast as Brand "B" when new, and were wearing out more slowly.

\*Test pieces, 1 x 1 tool steel bars, Rockwell hardness C-34. Pressure, 30 lbs., relieved on back stroke. Speed, 55 strokes per min.; stroke 6 in.



Try a dozen Deltas at our risk. Ask the Delta distributor in your territory for particulars.



## DELTA FILE WORKS

4837 JAMES ST. (BRIDEGSBURG) PHILADELPHIA



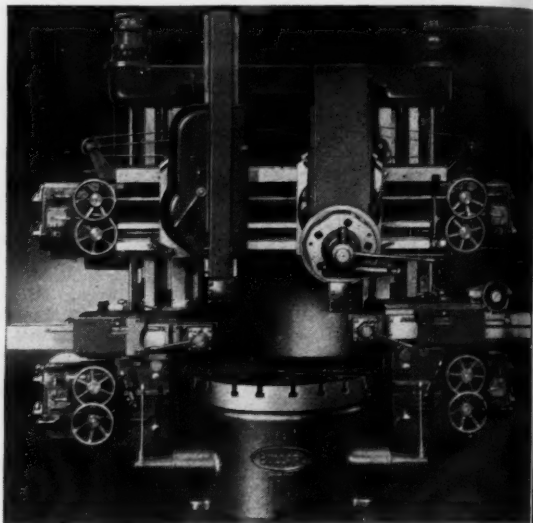
equipped with vertical and horizontal alignment adjustments, and is furnished with one set of reversible insert jaws, having a capacity of from  $\frac{1}{4}$  in. to 1 in. round stock.

A hand lever feed is used to advance the spindle onto the work. Change gears are supplied for each pitch of thread required. The machine can be supplied either for belt drive or with a 3-h.p., 1800-h.p., motor located on an adjustable mounting in the base of the machine. Splash type regulation supplies oil to gears, bearings and sliding gear shaft. Either the style KD die head using milled or tapped chasers, or the style TR, using tangent or circular chasers, can be furnished. The machine can also be equipped with collapsing taps.

By shifting a conveniently placed lever, four changes of speed are available from 176 r.p.m. to 642 r.p.m. The capacity of the machine is  $\frac{1}{4}$  in. to 1 in. inclusive, straight threads; 8 threads per inch or finer;  $\frac{1}{4}$  in. to  $\frac{3}{4}$  in. standard pipe threads; 5 in. spindle travel. The machine requires floor space parallel to the spindle of 55 in. and at right angles to the spindle of 26 in. The net weight of the machine without the motor is 1550 pounds.

sets the dial to the speed desired, moves the clutch lever to bring the table to a full stop, and then throws the lever back into the engaged position; in the interval, the gears are automatically shifted.

All parts of the machine are designed for the heavy-load duty imposed by four heads and 60 h.p. with a factor of safety of 4 at lowest speed. The cross-rail is provided with raising screws driven by



**Bullard Hydro-Shift Vertical Turret Lathe**

## The Bullard Company

Bridgeport, Conn.

Booth No. 205, North Annex

The display of machines in this exhibit will include a Bullard Hydro-Shift Vertical Turret Lathe, Bullard High-Speed Vertical Turret Lathe, Bullard Single Spindle Vertical Automatic Lathe, Bullard Type "D" Mult-Au-Matic and Bullard Type "J" Mult-Au-Matic.

The Hydro-Shift Vertical Turret Lathe, which is of recent design, has a hydraulic table speed shifting mechanism which includes a large direct reading dial indicator conveniently located at the right-hand side. The indicator gives readings of r.p.m. and cutting speed in feet per minute of various diameters within the size range of the machine. To change speeds, the operator merely

an individual motor for raising and lowering. For angular cutting, each of the rail head slides may be swiveled right or left to 30-deg. angles. To gain an added manufacturing efficiency, two side heads are mounted directly on the bed ways. Power traverse, vertical and horizontal at a rate of  $13\frac{3}{4}$  ft. per minute for any of the four heads is obtained by means of two individual motors.

The feed start lever, which controls the direction and start of feed, the feed trip lever, providing for instantly stopping the feed by pressure of the finger, and the hammer hand wheels, which permit accurate and fine feeding when starting or finishing cuts, are conveniently located on each feed bracket. An automatic overload "kick-out" prevents damage due to jamming either from overload or carelessness.

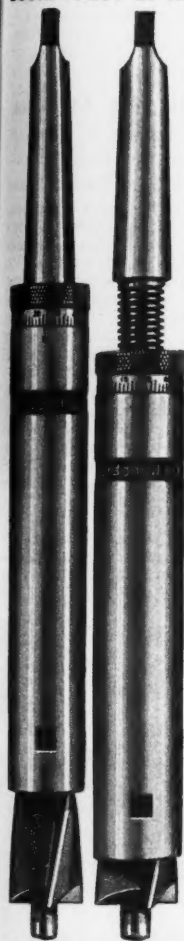
Wesson  
steel an  
tools an  
Booth /



# See WESSON TOOLS at CLEVELAND

Wesson high production, high speed steel and cemented carbide cutting tools and holders will be shown in our Booth A-209 at the Cleveland Show.

Typical of the quality and accuracy of Wesson tools, are the two holders illustrated here. These holders of different lengths are adjustable for length within any part of .0001 and need no locking or wrench to keep the adjustment in place.

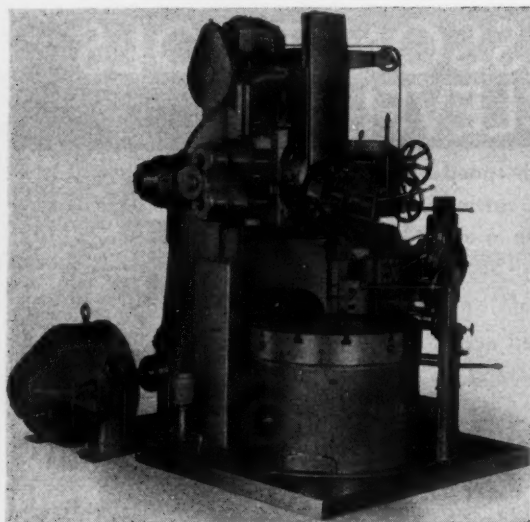


Here is the New Wesson Diamond Lapping Machine which will be on exhibition September 11-21 at the Berkeley Engineering Co., 1381 E. 17th St., Cleveland. Machine is entirely a self-contained, and compact unit driven with  $\frac{3}{4}$  H.P. reversible two speed motor. Tables are universal for any position desired as to relation with the diamond lap. Both wheels are thoroughly guarded. Machine is perfectly balanced, weighs 900 lbs. and need not be fastened to the floor. Full details on request.

## WESSON COMPANY

1052 Mt. Elliott

- Detroit, Mich.



**Bullard High-Speed Spiral Drive Type Vertical Turret Lathe**

Oil is distributed under pressure to the spindle and all of the bearings of the headstock and side heads. The oil pump is located within the bed and connected directly to the head stop. The main drive motor is 40 h.p., 900 r.p.m.; rapid traverse motor is 2 h.p., 1200 r.p.m., and the rail-raising motor is 3 h.p., 1800 r.p.m. All are push-button controlled. The machine is built in 46-in., 56-in., 66-in., 76-in., and 86-in. sizes. There are 16 table speeds and 16 feed changes for each size of machine.

The Bullard High-Speed Vertical Turret Lathe, spiral-drive type, is also a comparatively recent machine. The complete motorization of this machine fits it primarily for high-speed work and provides for the full advantages of metal-oid cutting tools. For example, in the case of the 36-in. machine, it is possible to obtain table speeds ranging from 4.6 to 200 revolutions per minute.

The main drive motor may be either d.c. adjustable speed, constant horse power, or a.c. multi-speed,

constant horse power with automatic control. To facilitate operation, the power traverse, rail-raising mechanism, and cutting lubricant system are each individually motorized. The lubricating system by means of its own motor drive, provides pressure lubrication to the spindle bearings.

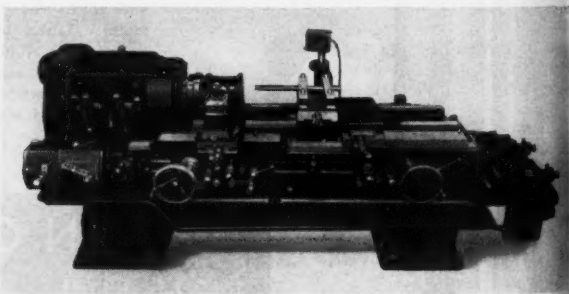
Table speed ranges are governed by available motor speeds. There are eight feed changes from 0.011 to 0.500 in. The machine is available in four sizes: 24-in., 36-in., 42-in., and 54-in.

### **The Monarch Machine Tool Co.**

Sidney, Ohio

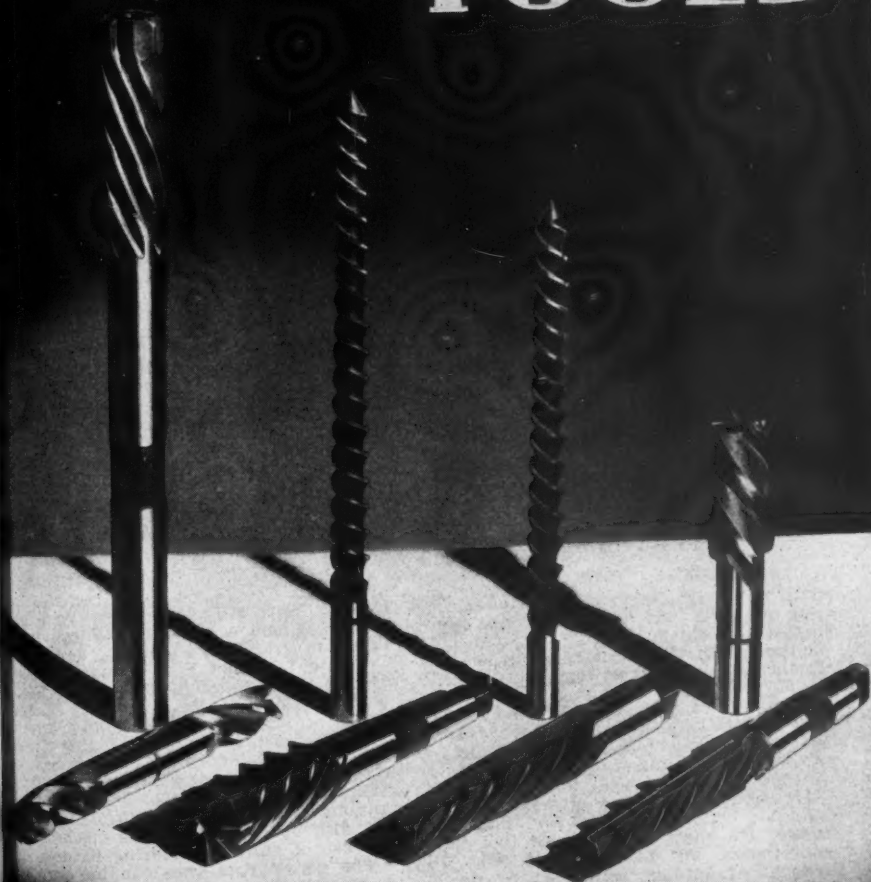
*Booth No. 813, North Annex*

Fifteen Monarch Lathes, two Monarch-Keller Magna-Matic Lathes, and a Monarch-Keller Automatic Form-Turning and Boring Machine will comprise this exhibit. All the Monarch Lathes are approximately 59 per cent heavier than they were before the introduction of cemented carbide tools. Other features that have been incorporated to keep pace with the modern trend are (1) 16 mechanical changes of spindle speeds, (2) anti-friction bearings, (3) automatic force feed lubrication to sliding way surfaces and automatic lubrication to the principal bearings, (4) scientifically hardened headstock and tailstock spindles, (5) all shafts inside the head stock, quick-change gear box, and apron, (6) all gears and other operating parts of hardened steel.



**Monarch-Keller Automatic Form-Turning and Boring Machine**

# GAMMONS TOOLS



## SPIRAL SPECIALISTS

AMMONS HOLMAN CO.

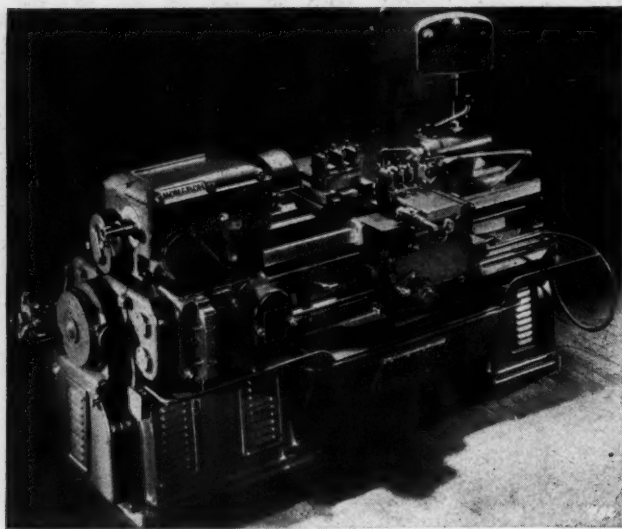
MANCHESTER, CONN.

The bed of the Monarch lathe is a semi-steel casting containing from 60 to 65 per cent steel, .75 nickel, and .35 chromium, providing a hard, close-grained casting with a Brinnell hardness of approximately 240 and a tensile strength of upwards of 50,000 pounds.

Monarch Lathes are all now provided

The same general type of electric controls are used in the Monarch-Keller Automatic Form-Turning and Boring Machine. On this machine a thin, metal template of the same outline as a cross-section of the work guides the turning or boring tool through an electrical contact tracer. The template is mounted

on a bracket at the back of the lathe. The tracer is held in a vertical position, located in fixed relation to the cutting tool and at a point where it will be in contact with the template. The tracer magnet box is geared to the leadscrew of the lathe and the crossfeed friction remains engaged when the machine is operating; thus the contour of the template is reproduced on the work.



Monarch-Keller Magna-Matic Lathe

with the Micro-Gaging method of selecting diameter and lengths which eliminates the old-fashioned "cut and try" method. This one feature alone is said to increase production from 10 per cent to 20 per cent.

The exhibit will include two electrically controlled Monarch-Keller Magna-Matic Lathes which are of the double carriage type and are provided with magnet clutches for all apron and tool slide feeds as well as a magnet main spindle drive clutch with magnetic brake. On these machines all tool slide movements, all diameters, and all lengths of cut are controlled by precision limit switches operating through relays to the magnet clutches. The entire control to the lathe is electric, including an automatic ratchet type relay which provides any desired feeding rate for any diameter of work, the different feeding rates being automatically secured as each different diameter on the work-piece is reached.

this exhibit will be a new Precision Thread Grinder, a new Vertical Dr Press of radically modern design, a Cemented Carbide Tool Grinder of new design, and a redesigned Hydraulic Unit.

The Ex-Cell-O Precision Thread Grinder is a self-contained, motor-driven machine designed for wet grinding either right or left hand threads, taps, chasers and worms. Eccentrically-relieved taps or chasers, either right or left hand continuous threads, and multiple threads can also be ground on this machine by the use of suitable indexing fixtures.

The capacity of the machine permits a maximum of 5x18 in. work to be held between centers, and threads up to 5-in. diameter by 8 in. long can be ground. The grinding wheel is 18-in. diameter by 1/2 in. thick with 9-in. hole and a stepped pulley makes it possible to increase the wheel speed as the wheel wears. The wheel spindle is mounted on a swivel and graduations in half-degrees are provided so that the spindle may be

### Ex-Cell-O Aircraft & Tool Corp.

Detroit, Michigan  
Booth No. 812,  
North Annex

Among the machines included in

6410 H

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# COMPLETE SERVICE

645 popular sizes of ready-to-use bushings—64 sizes of "Lubrico-Premier" cored and solid bronzes, fully finished, in the new economical 7-inch length—and 154 sizes of 13 inch cored and solid bars are carried in stock for your convenience. Send for the stock cards. • Complete facilities are provided for handling customers' specifications for unusual sizes or special metal analyses accurately and promptly. Refer your bushing requirements to the address given below. Let us show you that prompt shipment and wide experience can save you time and money.

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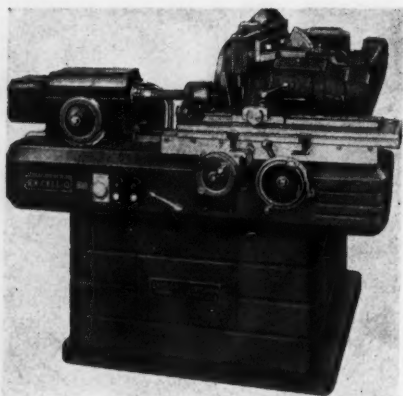
Robt. Bearing Co.,  
Newark, N. J.

S. H. Pooley Belting Co.,  
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R. R. Street & Co., Inc.,  
Chicago, Ill.

Carter, Milchman & Frank, Inc.,  
New York, N. Y.

The Strong, Carlisle & Hammond Co.,  
Cleveland, Ohio



Ex-Cell-O Precision Thread Grinder

swung in a vertical plane to a maximum of 15 deg. in either direction.

Threads can be ground from hardened or heat treated solid blanks to within a tolerance of 0.0002 in. per in. length, or an accumulative error not in excess of 0.0006 in. on longer work. Pitch diameters on work up to 1 in. diameter will not vary more than 0.0002 in. and on larger work the pitch diameter can be held to an additional tolerance of 0.0002 in. for each additional inch of diameter of the work.

The top of the base at the left is provided with one "V" and one flat way for mounting the work drive head. At the right end of the base is a machined pad on which are mounted the work table ways. Toward the back and at right angles is an elongated machined pad to which is secured the cross slide base on which is mounted the wheel spindle and driving motor.

The wheel spindle is mounted in Ex-Cell-O precision ball bearings. The end play in these bearings will not exceed 0.00015 in. under a reversed axial load of 20 pounds while the machine is in operation.

The Ex-Cell-O Cemented Carbide Tool Grinder is of new design and unusually sturdy construction. Two diamond wheels are driven by an in-built  $\frac{3}{4}$ -h.p. motor mounted in the main casting at the top of the machine. Correct rotation of wheels for right or left-hand tools is controlled by a reversing switch. An adjustable tool support table is located at each end of the machine to obtain the correct rake and angle on the tool.

A standard  $\frac{1}{4}$ -h.p. ball-bearing motor drives a ball-bearing centrifugal pump to supply coolant which is essential when using diamond wheels for carbide grinding.

The use of this machine is said to provide the following advantages: Increased life of tipped tools; reduction of 90 per cent in sharpening time; smooth finish and keen cutting edge which materially increases tool life between grinds; minimum amount of carbide removed per grind; elimination of checks and cracks caused by generated heat.

The Ex-Cell-O Hydraulic Power Unit will be shown in two new models. Modern design enhances the smooth lines, general appearance, efficiency, and usefulness of the unit. The unit is compact and self-contained, and is particularly adapted for drilling, reaming, counter-boring, spotfacing, and similar operations. The unit can be mounted either singly or in multiple and in vertical, horizontal, or in any desired angular position.

The small unit shown in the illustration has an 8-in. stroke and the larger unit has a 10-in. stroke. The range of feed on both units has been increased to 1.32 in. per minute with a rapid approach and return of 300 in. per minute on the small unit and 230 in. per min-



Ex-Cell-O Carbide Tool Grinder

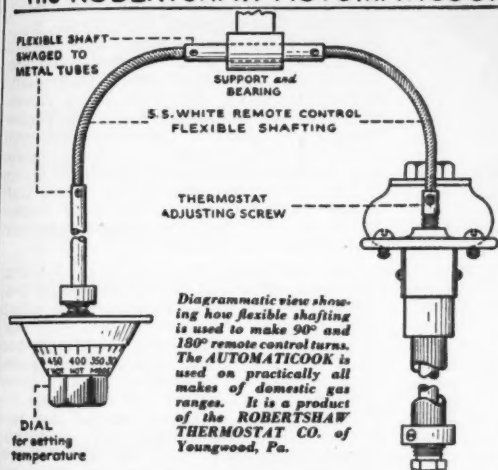
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# The FLEXIBLE SHAFT

## The ROBERTSHAW AUTOMATICOOK



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REMOTE  
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problem

Where mechanical remote control must be carried around one or more turns, it can be done readily and effectively with flexible shafting.

The ROBERTSHAW gas oven temperature control furnishes an example. In some of the ranges

on which the control is used, the position of the operating dial in relation to the thermostat adjusting screw, makes a 90° turn necessary. In others, a 180° turn is required. The illustration shows how these turns are made with short lengths of flexible shafting.

S. S. WHITE Remote Control Flexible Shafting is used. This shafting was developed to meet remote control requirements. It differs from conventional flexible shafting in that it has very little torsional deflection under load, and deflection is equal for either direction of rotation.

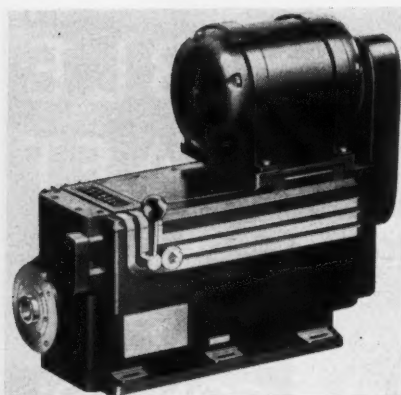
### IF YOU HAVE A REMOTE CONTROL PROBLEM

let our engineers help you work it out. Send us details of the problem and we'll give you our recommendations—without obligation.

**The S. S. WHITE Dental Mfg. Co.**  
**INDUSTRIAL DIVISION**

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NEW YORK, N. Y.

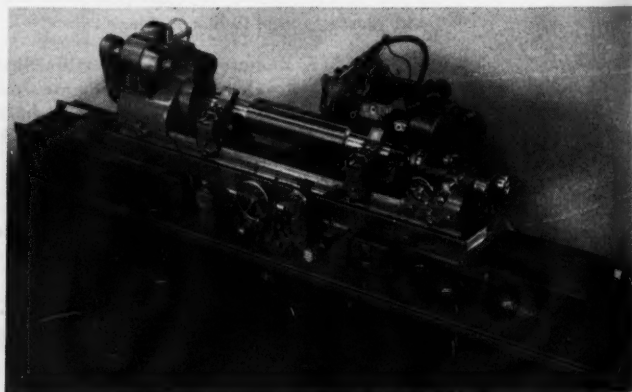


Ex-Cell-O Hydraulic Power Unit

ute on the large one. Two forward feed rates, independently adjustable from the side of the unit, permit selection of the proper rate while the unit is feeding to suit drilling, counterboring, spotfacing, or similar operations.

The hydraulic pump is driven by V-belt from an electric motor mounted at the rear of the unit, the pump shaft being connected through change gears to the spindle-driving shaft. The quill that supports the spindle is furnished with a flange for attaching multiple spindle heads. The hole in the spindle nose is accurately ground and has a driving keyway to permit the use of adjustable-length sleeves if so desired.

Fig. 1—  
Cincinnati  
Roll  
Grinding  
Machine



## Cincinnati Milling Machine Co. Cincinnati Grinders, Incorporated

Cincinnati, Ohio

Booth No. 207, North Annex

This exhibit will contain the following machines: 12x72-in. Universal Self Contained Grinding Machine, New Saddle Type Grinding Machine, No. 3 Centerless, No. 2 Centerless Infeed, No. 2 Centerless Thrufeed, Plain Self Contained and Roll Grinding Machine, two No. 1-12 Plain Automatic Milling Machines, No. 2 Milling Machine, No. 2 Universal High Speed Dial Type, No. 2 Vertical High Speed Dial Type, No. 3 Plain Dial Type with Universal Overarm Attachment, No. 3-24 Plain Hydromatic Milling Machine, No. 4-36 Plain Hydromatic Milling Machine, No. 45-60 Duplex Hydromatic Milling Machine equipped with Vertical Spindle on fixed height rail, Centerless Lapping Machine, Hydro Die Sinker, Hand Die Sinker, No. 2 Universal Cutter Grinder, No. 2-36 Duplex Hydro-Broach, No. 5-42 Duplex Vertical Hydro-Broach.

The Cincinnati Roll Grinding Machine has been improved in design, many features having been incorporated which both simplify the operation of the machine and increase the accuracy and finish of the work. The wheel truing unit is now independent of any other unit on the machine. Motive force for traversing the diamond across the face of the wheel is supplied by a hydraulic cylinder located behind the wheel guard, and the arrangement is such that the wheel can be trued either perfectly straight or with a slight crown as required by the type of roll. A single di-



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changeable Counter-  
bores, Countersinks,  
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rectional control lever determines the direction of travel of the truing tool across the wheel, while the setting of a knurled knob determines the rate of traverse.

A new type of plain spindle bearing, pre-loaded and self-aligning in action, increases the finish and accuracy. All electric control buttons are conveniently centralized and enclosed in neat boxes.

Two types of cambering mechanisms are available for this machine; bar type or cam type. The flexibility of the bar-type cambering device allows a wide variety of concaves or crowns to be ground on the roll. This mechanism consists of an auxiliary bed, securely bolted to the rear base of the machine and supporting a traversing table which carries a camber bar. Motion to the camber table is transmitted by and synchronized with the machine table. Jack screws aid in setting the camber bar to the curvature corresponding to the roll, or a permanent bar can be used when a single curve is used for all rolls.

A shoe, fixed to the tilting wheel head casting through an intermediate bracket, forms the contact between the wheel head and the camber bar. As the camber table traverses, the wheel is tilted forward or away from the roll due to the bearing shoe riding on the bar. New

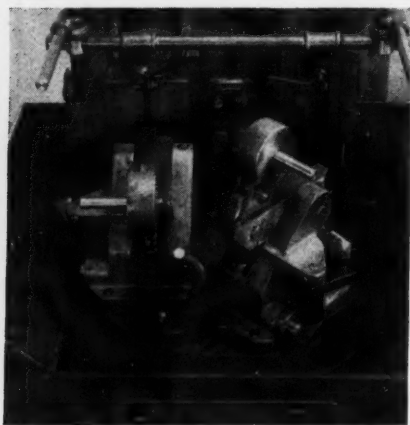


Fig. 2—Cincinnati No. 2-36 Vertical Duplex Hydro-Broach set up for broaching spring perch boss on front radius rod support.

set-ups are easily and quickly made, permitting of work within close limits.

The cam type cambering device consists essentially of a train of pick-off

gears and cam which are driven by the machine table, and a tilting wheel head which is operated by the cam. The change gears drive a shaft which extends through the bed and to which a cam is affixed at the rear end. The cam oper-



Fig. 3—Cincinnati No. 5-42 Duplex Vertical Hydro-Broach broaching inside faces of front radius rod feet.

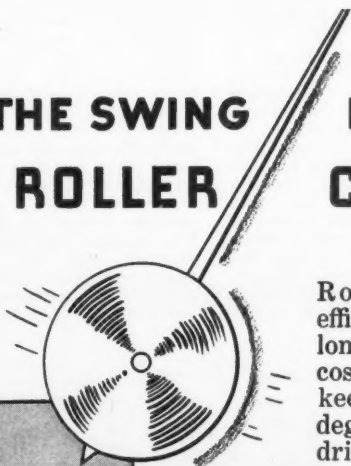
ates a lever and plunger under the rear end of the wheel head and this unit, being mounted on trunnions, is tilted forward or away from the work as the cam rotates, thereby producing the desired concave or convex shape on the roll. A hydraulically-operated back-lash device, automatic in action, eliminates play from the entire mechanism. The cambering mechanism is engaged by movement of a single lever at the front of the table. Accuracy is positive and the camber is a known quantity.

The new No. 2-36 Duplex Hydro-Broach and No. 5-42 Duplex Vertical Hydro-Broach are two excellent examples of a line of broaching machines which has been developed by the Cincinnati Milling Machine Co. to perform machining operations which were formerly possible only by slower and costlier methods. The broaching process is now being used not only for the finishing of round holes, but also for producing irregular shaped holes and for finishing exterior surfaces of various kinds.

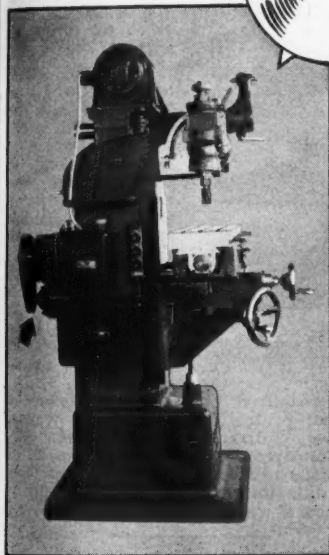
The illustration Fig. 2 shows a Cincinnati No. 2-36 Vertical Duplex Hydro-Broach, equipped with two rows of high speed steel facing inserts 20 in. long held in a sub-plate taper gib adjustment, in use for broaching both sides of the spring perch boss of a front radius rod support for an automobile. The work-piece is of forged steel. The

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## BALDWIN DUCKWORTH

broach removes 3/32 in. of stock and travels at a speed of 34 ft. per minute, the time per piece being .086 seconds or 550 pieces in 48 minutes. The machine cycle is automatic but it may be stopped or started at any point by convenient hand or foot levers. One fixture is reloaded while the other is in process. The work-holding fixtures, mounted on the indexing table of the machine, are designed to hold one left hand part and one right hand part. The work is located from previously broached inside bosses.

Fig. 3 is a close-up view of the No. 5-42 Duplex Vertical Hydro-Broach, broaching inside faces on front radius rod feet for a well known "V-8" auto-

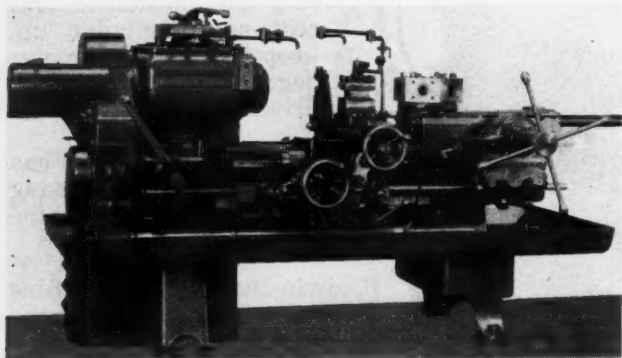
traverse to the cross slide is electrically driven and is geared to the feed screw with a sturdy switch for forward and reverse action. Heavy duty chucking tools will accommodate 1 1/4-in. square tools of high speed steel, Stellite or carbide. The machine is equipped with a multiple turning head, stationary overhead pilot bar and both plain angle and adjustable angle cutter rollers.

A new type of cutting speed pre-selector makes it possible to determine the correct cutting speed in feet instantly; thus the operator will use as many speeds as may be required on several work diameters. The speed pre-selector makes it unnecessary to remem-

ber a sequence of spindle speeds with their lever positions. Single lever operation is provided for both gear shift and clutch.

The lead screw is solid, with no key ways and no sleeve. The pick-off gear box is at the head end of the machine and carriage return is available without spindle reverse. An automatic longitudinal carriage stop makes it possible to thread close to the shoulder. Hardened ways are optional on all machines.

The patented covered way system of bed wear protection provided on Warner & Swasey Turret Lathes has been further improved by the addition of Bljor automatic lubricators for both carriage and saddle units. Reservoirs need filling but once a week.



Warner & Swasey Universal Turret Lathe with New Lead Screw Attachment

mobile. The tool travels at a speed of 31 ft. per minute, removing 1/8 in. of stock at an estimated rate of 515 pieces per hour. The total weight of this machine is 14,000 pounds.

## The Warner & Swasey Company

Cleveland, Ohio

Booth No. 905, North Annex

Two new Heavy Duty Universal Turret Lathes will be included in this exhibit—a Warner & Swasey No. 3A and No. 4A. The features of both machines include deeper and heavier bed sections than have been used heretofore, new heavy duty cross slide carriage and square turret, a heavier hexagon turret, independent lead screw and automatic bed way lubrication.

The square turret carriage is built onto a heavy duty cross slide with steel strips which are replaceable. The rapid

## The Oliver Instrument Co.

Adrian, Mich.

Booth No. 208, North Annex

This company will have on exhibit, for the first time, a Full Automatic Face Mill Grinder for sharpening the teeth of a face mill entirely by automatic means. In operation, the cutter is mounted on a work spindle which is mechanically indexed to bring each successive tooth into position under the grinding wheel where it is held in proper relation to the wheel by means of a lip rest attached to a ram which carries



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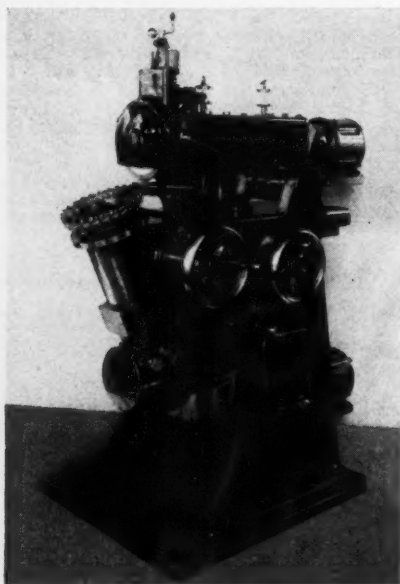


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**BEHR-MANNING, TROY, N.Y. U.S.A. DIVISION OF NORTON COMPANY**

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and reciprocates the wheel. No index plates are required, the adjustment for various numbers of teeth being made in



Oliver Full Automatic Face Mill Grinder

the indexing mechanism.

The form of tooth produced is governed by a hardened cam which may be varied to suit the special use for which the cutter is intended. In grinding a cutter having tungsten-carbide inserts, it is not necessary to back off the carbon steel blade as the wheel cannot load due to the fact that, with each reciprocation of the wheel it passes over a diamond dresser which keeps it properly formed and sharpened. The dressing of the wheel is also mechanically controlled.

The ram traverse and indexing mechanism are actuated by gearing within the body of the machine. Two speeds are available; 15 strokes per minute for roughing and  $7\frac{1}{2}$  strokes per minute for finishing. All shafts in the machine are mounted in ball or roller bearings and the workmanship is in keeping with the precision work for which the machine is intended. Cutter blades are ground to a very fine finish and extremely close accuracy.

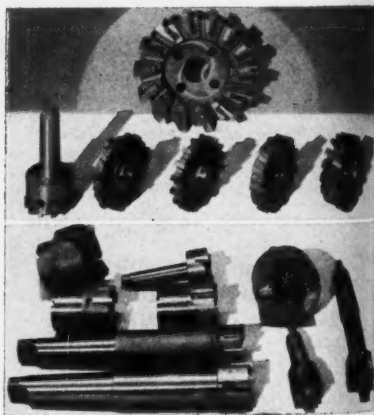
## Ingersoll Milling Machine Company Rockford, Ill.

Booth No. 810, North Annex

An interesting feature of this exhibit will be an assortment of the new Ingersoll Zee Lock Cutters. Designed as a heavy duty face milling cutter, the application of the "Zee Lock" principle has been adapted to other types of milling cutters and also to boring, facing, hollow milling, and combination tools.

The Ingersoll Zee Lock Cutter Blade is retained in the cutter housing by a Z-shaped wedge. The wedge hooks the front of the cutter body and the back of the blade, making it impossible for the blade to shift backward or inward away from the cut. The back hook of the wedge is designed on a slant so that when the cutter blade is reinserted after having been moved out one serration, it also moves forward a slight amount, compensating for the face wear. No additional parts or shims are required for resetting. The wedge is the locking member and is not affected by the thrust of the cut as this thrust is absorbed by the serrations.

The Ingersoll Zee Lock Milling Cutters shown in the illustration will be exhibited in operation on Ingersoll milling equipment at the Show. Included are face milling cutters, shell end mills, and mills with solid shank, half side milling cutters, staggered tooth cutters, plain



Ingersoll Zee Lock Cutters

side milling cutters, core drills and reamers, counterbores, facing heads, low mills and combination tools. In

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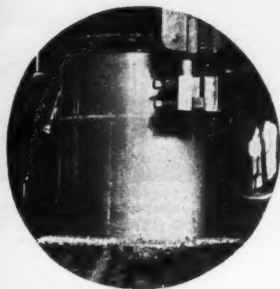
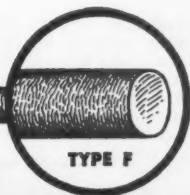
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## "That Electrode does a swell job"



*Above: Ball-mill trunnion being machined to size after it had been built up with G-E Type F electrode*

*Left: The machining job nears completion*

THE accompanying pictures show a ball-mill trunnion that is being machined after having been built up with G-E Type F general-purpose electrode. Even if you looked closely at this shaft, you could not detect that the machined surface is deposited weld metal. Type F did the job without leaving a single flaw; also, it machined as easily as the parent metal.

### **And here's why Type F did this job so well**

With this electrode, it is easy to accomplish excellent results without painstaking attention to arc length and magnetic blow, for the light flux-coating provides excellent arc stability. Correct proportions of metal and flux permit it to fuse well with all mild steels and with most medium-carbon

steels. It gives equally good results in all positions. Welds produced with Type F are strong, smooth, and ductile. It has normal arcing characteristics, a good rate of deposition, good penetration, and high deposition efficiency.

There are 14 types of G-E welding electrodes, including bare, lightly fluxed, and heavily coated, each of which exactly suits one of your welding requirements. Also, there is a complete line of G-E welding machines, welding accessories, and cable. The G-E welding distributor or G-E sales office nearest you will be glad to send you further information on G-E arc-welding equipment. General Electric, Schenectady, N. Y.

150-43

# GENERAL ELECTRIC

cluded also will be the Ingersoll helical milling cutter which has an inserted cutter blade forged and twisted to a true helix giving a constant rake angle.

An Ingersoll Cutter Grinder will be included in the exhibit, both for display and for maintenance of cutters in use.

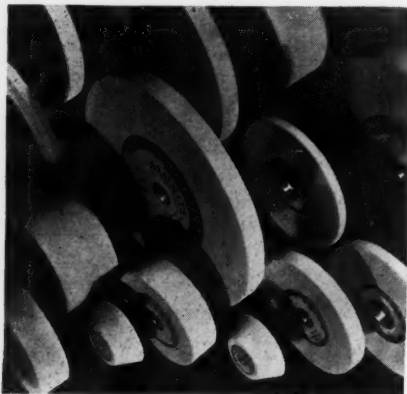
## Carborundum Company

Niagara Falls, N. Y.

### Booth No. E-408, Exhibition Hall

Among the many abrasive products to be shown in the exhibit of The Carborundum Company, several new types of grinding wheels will be featured.

First of all, it will be interesting to visitors to the exhibition to learn that in the attractive exhibit of The Carborundum Company there will be shown hundreds of examples of most interesting grinding operations including many outstanding jobs of centerless, cylindrical, internal and surface grinding on products ranging from twelve cylinder crank shafts to tiny broaches and bearings. In all, there will be about 1,000 examples of grinding work, and in finishes these will range from the rather crude, rough work of steel billets to the beautiful ultra-finishes produced by wheels as fine as 500 grit. All of these examples of modern grinding work will

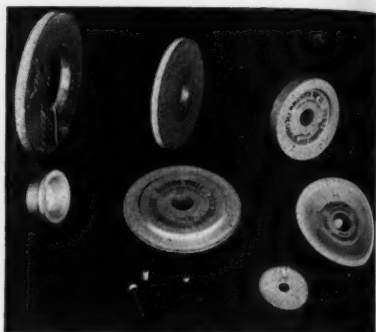


Pure white color characterizes this typical group of The Carborundum Company's Improved Aloxit Brand "AA 170 Bond" Tool Room Wheels

be shown and arranged in the most attractive setting.

The new wheels to be featured include

the Aloxit Brand "AA" Tool Room Grinding Wheels which embody some improved and interesting features. These "AA" Wheels are identified by the clean, pure white color and are produced in combination with the new "170 bond"



Various sizes and shapes of the Carborundum Company's New Diamond Wheels for sharpening cemented carbide tools.

which gives a wheel much freer in its cut. It has greater ease of penetration and it requires far less grinding pressure. It has been found that these improved wheels have less bond interference, giving the new type of aluminum oxide grain a real chance to go into grinding action. It is a wheel that is most carefully balanced as to grain, bond and structure, and has just the proper breaking down action. The new improved "AA" wheel has maximum flexibility taking light to heavy cuts with the same efficiency and with low wheel wear, handling a wider range of steels and wider areas of contact. They require less dressing, save operating time, save diamonds, generating less heat resulting in less work, distortion and checking.

Another tool room wheel to be featured is the new "270 Bond" Wheel. This wheel is identified by its light blue color and is known as a production wheel for the tool room. It, too, is created from a new type of aluminum oxide abrasive combined with "170 bond" and is offered particularly for the grinding of duplicate parts. It has all of the fast, clean cutting, economical qualities of the "AA" Wheel but is not quite as flexible in its applications, being produced for production work.

There will also be an exhibit and demonstration of the Carborundum Company's Diamond Wheels for the

TOOL ROOM ADJUSTMENT

TOOL ROOM ADJUSTMENT

TOOL ROOM ADJUSTMENT

THI

# JUST ONE OF OUR MANY CONTRIBUTIONS

of close limit  
multiple-cut  
tooling . . . TO THE  
MACHINE TOOL  
INDUSTRY

**T**HIS tool is one of our most recent designs to meet the industry's exacting needs and to anticipate and be prepared for tomorrow's requirements.

Our long and varied experience in cutting tool manufacture, enables us to design special applications which cover a broad scope and will assist you to secure better performance and reduce tool costs.

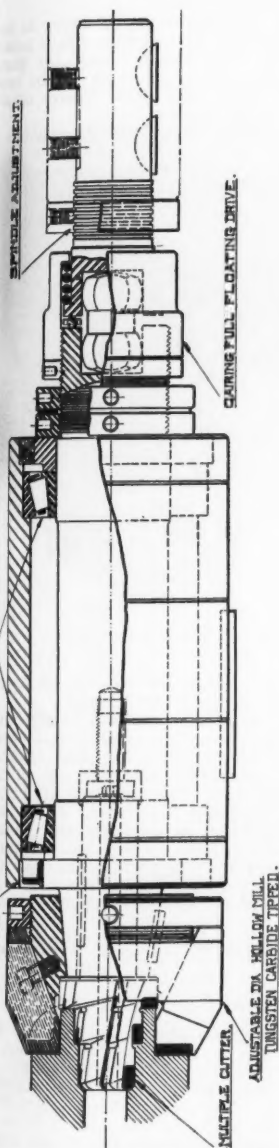
The possibilities of the important savings through a better knowledge of the wide field of application of Gairing Tools, is worthy of careful attention. Tool engineers interested in the application of combined and multi-blade cutting tools will be furnished complete recommendations, upon request by the Gairing Engineering Department.

We have arranged authoritative designs of special tools from our engineering files, which we have furnished to manufacturers of widely diversified products. Write for catalog describing the most complete line of end cutting tools available. Let our engineers work with yours.

Representatives in principal cities.

## THE GAIRING TOOL COMPANY

DETROIT, MICHIGAN



grinding and conditioning of hard cemented carbides. These wheels will be shown in actual operation on an Ex-Cell-O Grinding Machine. A complete assortment of the new improved disc wheels recently introduced by The Carborundum Company for surface grinding will also be shown.

### Greenerd Arbor Press Co.

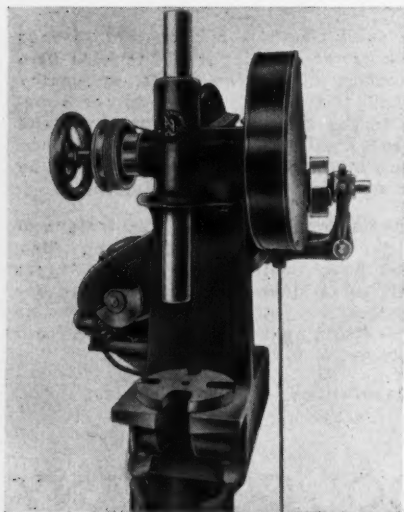
Nashua, N. H.

#### Booth No. E-506, Exhibition Hall

This exhibit includes the following machines:

Greenerd No. 50 Motor-Driven Arbor Press; Greenerd No. 40 12-Ton Bench-Type Arbor Press; Greenerd No. 30 Armature Press; Greenerd No. 3A Ratchet-Type Arbor Press.

The No. 50 Motor-Driven Press is especially designed for rapid continuous work such as assembling, broaching, plastic moulding and so on as well as for general utility uses. A  $\frac{3}{4}$ -h.p. motor through reductions drives the ram which is controlled by a clutch and foot control. Three tons pressure at the bottom of the ram can be delivered by a slight pressure on the foot treadle. The ram travels  $11\frac{1}{4}$  in. in 9 seconds. Stroke is adjustable up to  $11\frac{1}{4}$  in. Diameters up to 12 in. can be accommodated.



No. 50 Motor Driven Press

The No. 40 Bench Type Press is intended for those who need a heavy bench arbor press. The height over the plate is 20 in. and the movement of the rack is 15 in. This press will receive diameters up to 22 inches.

The No. 3A Ratchet-Type Press is much



No. 40 Bench Type Press

quicker and more convenient of operation than the slide lever type.

The No. 30 Armature Press was designed to meet the demands of electrical repair men, but its construction and capacity makes it adaptable also for use in the assembling and disassembling of piston bushings, spindle bushings, gears, and so on. Three tons pressure can be obtained with this press. The opening under the ram is 6 in., height over the plate is  $17\frac{1}{2}$  in., and the press will receive diameters up to 12 inches.

### The Euclid Electric & Mfg. Co.

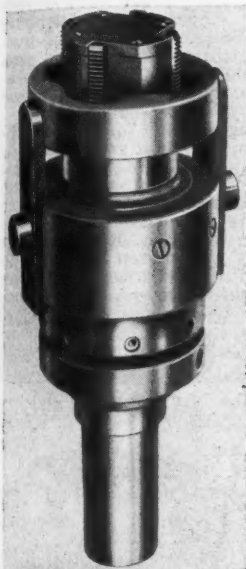
Euclid, Ohio

#### Booth No. A-202, Arena

The equipment exhibited by The Euclid Electric & Mfg. Co. will consist of electric controls of various kinds, including Built-In Controls for Machine Tool Service, Across-the-Line Drum Type Reverse Switches for Machine Tool Service, Plugging Switches for Quick Stopping of A.C. Motors for Applying Reverse Torque, Reverse Panels, Foot-Operated Switches for Controlling Small Motors, Non-Reverse Slip Ring Regulators, and Heavy Duty Field Rheostats.



# « SPECIALISTS »



**COLLAPSIBLE TAPS**

For over 20 years  
making Tools and  
Machines for Precision  
Thread Cutting.

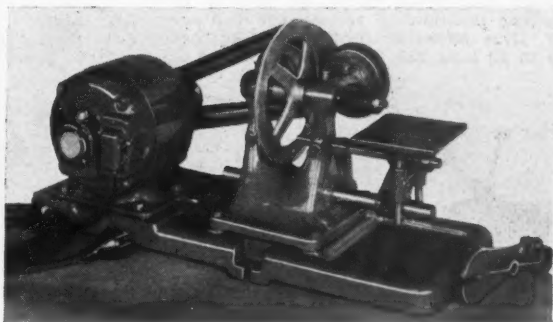


*Mr. Pitch*

## INVESTIGATE R - S PRODUCTS

Self-Opening Die Heads, Collapsible Taps,  
Automatic Threading and Tapping Ma-  
chines, also Cutting-off Machines  
and Chaser Grinders

### TAPPING MACHINES

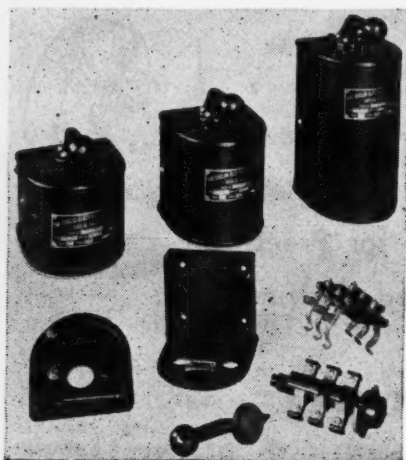


**RICKERT - SHAFER CO.**

CHERRY ST. AT 11th

ERIE, PENNA.

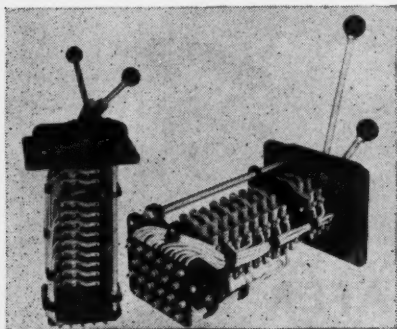
*Representatives in All Principal Cities*



**Euclid Across-The-Line Drum Type Reverse Switch for Machine Tool Service**

The Built-In Control for Machine Tool Service consists of a combination of a non-reversing drum-type 4-speed selector and reversing motor. A magnetic reversing panel with overload protection is used for reversing the main lines. The operating lever for the master has two positions; start and run, in each direction.

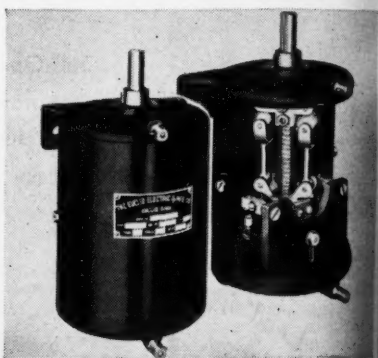
The lever is thrown full on to start, and when released returns to the "run" position. In case of overload or voltage failure the lever must be moved to starting position to reclose the contactor, thus affording protection. Ratings up to 10 h.p., 220, 440, or 550 volts A.C.



**Euclid Built-in Control for Machine Tool Service**

The Across-the-Line Drum Type Reverse Switches for Machine Tool Service and the Reversing and Non-Reversing Multi-Speed Controllers are made in ratings up to 2 h.p., 220, 440, and 550 volts A.C. or 1 h.p., 230 or 550 volts D.C. and for single phase, polyphase, series, or compound motors. The drum construction utilizes stamped steel parts with removable copper drum contacts. Fingers are mounted on Bakelite base with Euclid-type finger spring.

The Plugging Switch for quick stopping of A.C. motors used with Magnetic Reversing Contactor for applying reverse torque is of the centrifugal type with contacts, suitable for pilot circuits which close when the motor is running. The switch may be mounted either vertically or horizontally and driven in either direction by direct connection to the motor or machine or by a belt. Being of the centrifugal type, it opens the contacts accurately at the speed for which it is adjusted, and is not affected by temperature changes or wear. It can



**Euclid Plugging Switch for Quick Stopping of A.C. Motors**

be used with multi- or single-speed motors and will accurately stop motors when inclined or when operated at full speed.

The switch is made in two forms; the single circuit type is used with motors operating normally in one direction and the double circuit type when the motor operates normally in either direction.

### **The Rotor Air Tool Company**

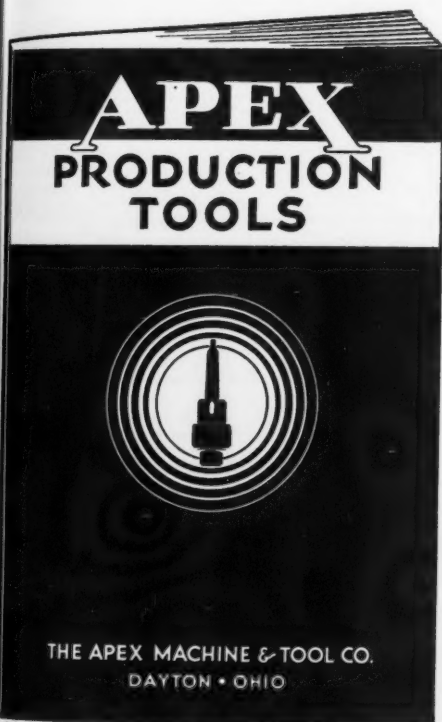
Cleveland, Ohio

Booth No. E314, Exhibition Hall

A new line of "High Cycle" electric tools and two new air tools—the Type



*A complete line of Production Tools for Drilling, Tapping, Reaming, Boring, Stud and Nut Setting, Screw Driving, and similar operations.*



#### APEX S & H REAMERS

A complete line of Adjustable, Inserted Blade Shell, Machine and Hand Reamers and special line reamers.

S & H Reamers have been manufactured by the Schellenbach-Hunt Tool Company, Cincinnati, Ohio, since 1899. Purchased by us June, 1935 and now manufactured in our factory at Dayton, Ohio, by the same skilled workmen who have been with the S & H Company for many years.

Apex Production Tools and Apex S & H Reamers are used by nearly 3000 manufacturers whose repeat orders prove that Apex Tools do increase production and decrease costs.

*For full information write for Catalog No. 8.*

**THE APEX MACHINE & TOOL CO.**

THIRD AND MADISON STREETS, DAYTON, OHIO



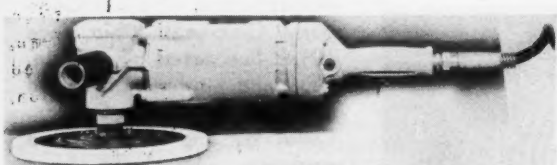
Rotor 6-In. Hicycle Grinder



Rotor 4-In. Hicycle Grinder



Rotor Model B Hicycle Buffer

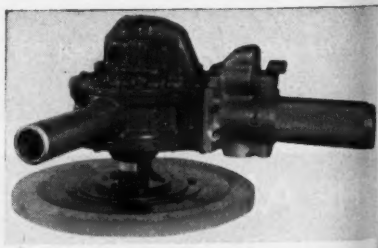


Rotor Model VS Hicycle Sander

B-1 Disc Sander and the Type E-50-C Drill—will be presented in this exhibit for the first time. The "High Cycle" line includes a 4-, 6-, and 8-in. grinder, 6- and 8-in. buffer, 7- and 9-in. disc sander and 6-in. right angle grinder.



Rotor Type E-50-C Air Drill



Rotor Type B-1 Disc Sander

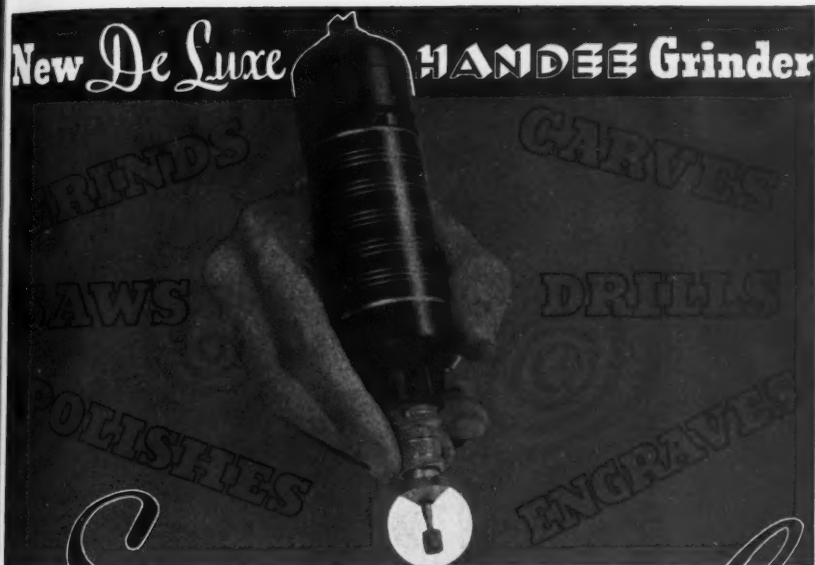
Several innovations have been incorporated in the design of the "High Cycle" tools which, according to the manufacturer, increases the power factor and operating efficiency without increasing the weight.

The motor is of the welded copper squirrel cage type. The inside of the casing has 12 broached slots to receive 12 keys on the stator laminations and the laminations are held together by 12 substantial lamination rivets, making it impossible for the stator to work loose. This construction also provides 12 large air channels in the casing which, together with a solid web fan, facilitate cooling. Handles and casing are of magnesium alloy to provide high tensile strength with light weight.

The Type B-1 Disc Sander carries a 9-in. sanding pad and weighs but 10 lbs. The motor is of the twin-rotor external blade type. The feature of the machine is the fine balance, which has been accomplished by building the motor low and of large bore so that the two handles, placed at right angles, are close to the work. A new type of quick-acting governor reduces the air supply when the tool is running idle and increases it as the load is applied.

The Type E-50-C Drill is made in both reversible and non-reversible types and

# New De Luxe **HANDEE** Grinder



## *Sensational* **ELECTRIC TOOL**

... Nothing else like it. New design—modern materials—revolutionary performance. With a speed of 25,000 r.p.m. and ample power, this compact, easy-to-handle production tool does 1001 jobs with astonishing savings in time and labor. Will not heat in continuous service.

Weights 12 ounces. 6" long, 1 5/8" in diameter. Fastest and most powerful portable tool for its weight and type ever developed. Price \$18.50, complete with 6 Chicago Mounted Wheels. 10 Days Trial.

*Ask Your Supply House For Demonstration  
Or Write For More Detailed Information*

**CHICAGO WHEEL & MFG. COMPANY**  
110 S. Aberdeen Street Chicago, Illinois

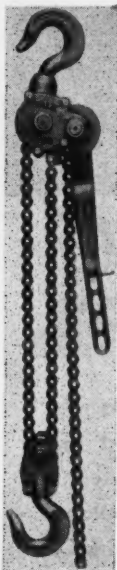
in two speeds. The 450-r.p.m. model is rated for 29/32 in. drilling and 11/16 in. reaming capacity, and the 360-r.p.m. model is rated for 1 in. drilling and 13/16 in. reaming capacity. This motor is also of the twin-rotor external blade rotary type. The construction is simple and eliminates numerous parts as well as substantially reducing the weight. The tools weigh 20 pounds.

### The Yale & Towne Mfg. Co.

Philadelphia, Pa.

#### Booth No. E-100, Exhibition Hall

This display will include Yale Electric and Hand Chain Hoists, Trolleys, Yale Electric Industrial Trucks, Yale Hand Lift Trucks and Skid Platforms, and the Yale "Pul-Lift."



Yale  
"Pul-Lift"

The Yale "Pul-Lift" is a unique device for which an almost unlimited number of applications can be found. Although light and portable, the tool will find ready application in a wide variety of cases where extra power is required either to lift vertically or to apply tension horizontally.

The tool consists primarily of a lift to which is attached one hook, and a chain to which is attached the other hook. Used vertically as a hoist, one man can use it to lift all types of load up to the capacity of the device. Used horizontally, it is efficiently employed in stretching cables, pulling boiler tubes, moving machines into position, holding beams and supports in position, and so on.

The "Pul-Lift" is made in  $\frac{3}{4}$ ,  $1\frac{1}{2}$ , 3, and 6-in. capacities. The lifting mechanism consists of a ratchet and pawl on the smaller capacity models, with gear reduction on the larger capacities. The design permits the operator to select the handle position most convenient. The Weston type of self-actuating load brake holds the load firmly at all times. Load hooks are of heat treated drop forged steel. Moving parts are completely enclosed so that they may be operated in grease and protected from injury.

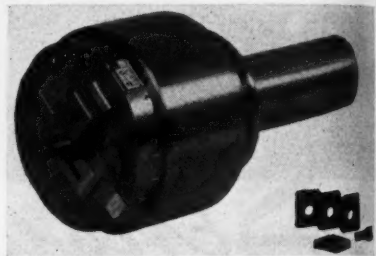
### The Eastern Machine Screw Corporation

New Haven, Conn.

#### Booth No. 900, North Annex

This exhibit presents the complete line of H & G General Purpose Self-Opening Die Heads, H & G Insert Chaser Self-Opening Die Heads, H & G Solid Adjustable Dies Using Insert Chasers, H & G Threading Machines, and H & G Chaser Grinders.

The latest addition to the above lines is the Solid Adjustable Die Head Using Insert Chasers, shown in the illustration. This tool makes it possible for manufacturers who are accustomed to using solid die heads of various types to take advantage of the low cost and



Solid Adjustable Die Head Using Insert Chaser

unusual endurance and accuracy of the insert chaser. This head uses the same insert chaser as is used in the regular line of Insert Chaser Self-Opening Die Heads produced by this company, and the tool is only about one-fourth the weight of corresponding die heads.

Instead of the usual large chaser of high speed steel, however, carriers are substituted that take small high speed insert chasers. The chasers are held in place by a single screw that has a draw-in feature which locks the insert back in the carrier so as to insure tracking and even distribution of the cut. There is no strain on the chaser since all thrusts are taken by the carrier.

Carriers for any die head size are made to take inserts for definite diameter rangers, and the inserts are interchangeable in all die heads having four chasers to the set. When insert chasers are worn out, a new set can be inserted with practically no loss of time, thus the advantages of the head consist of reduced set-up time, reduced down time, uniform quality of thread, minimum of threading troubles, and lower costs, and increased production.



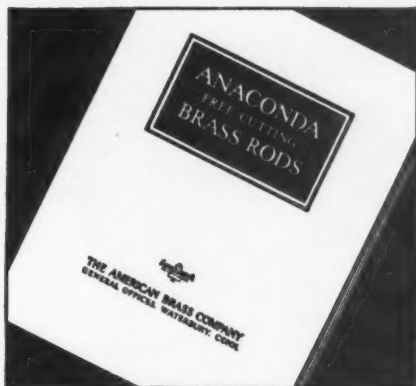
# Can you save money by spending more for stock?

*This free booklet tells how Brass Rod cuts costs of screw machine products . . .*

THIS complete new booklet has been called a "liberal education" by experienced production men. Going thoroughly into details, it treats of tool life, tool breakage, power consumption and the many other factors that help determine the ultimate cost of screw machine parts.

Special cold drawn and extruded shapes . . . that save their metal cost many times over by eliminating expensive milling and other machining operations . . . are reviewed in detail.

In addition to Brass, the characteristics



of Anaconda Free Cutting Phosphor Bronze, leaded Nickel Silver, Everdur, and other Anaconda Free Cutting Alloys are also described.

If you make, sell, buy or use screw machine parts of any metal, you'll want this booklet. For your copy, mail the coupon today.

## THE AMERICAN BRASS CO.

General Offices: Waterbury, Connecticut

*Offices and Agencies in Principal Cities*

**MAIL  
THIS  
COUPON  
NOW!**

THE AMERICAN BRASS CO., Waterbury, Conn. MMS 8

Please send me a free copy of your new Brass Rod Booklet, Anaconda Publication B-14, by return mail.

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City \_\_\_\_\_ State \_\_\_\_\_

# ANACONDA COPPER & BRASS

**Wesson Company**

Detroit, Michigan

**Booth No. A-209, Arena**

The Wesson Company's exhibit will include High Speed Steel and Cemented Carbide Cutting Tools and Holders, Cemented Carbide Drills, Reamers, Coun-

**Wesson Diamond Lapping Machine**

terbores, Milling Cutters, Core Drills, Back Spot Facers, Multi-Diameter Tools, Diamond Lapping Machines and Special and Standard Tools and Gauges.

A new addition to the Wesson line is a Diamond Lapping Machine for use in lapping cemented carbide tools. The machine is entirely self-contained, and perfectly balanced to preclude the possibility of vibration. Power is supplied through a reversible two-speed  $\frac{3}{4}$ -h.p. motor, suspended within the casing of the machine. This reversible motor is an important feature of the machine in that it enables the operator to work from either side of the wheel. The pump is necessarily reversible also and the sump pan is located in the lower part of the machine. Parts exposed to the water are chromium plated.

Both wheels are thoroughly guarded

with adjustable wheel guards which also act as splash guards. The spare belts are suspended over the spindle so that if one belt should break, replacement may be made without loss of time. The weight of the machine is 900 pounds.

**Black & Decker Mfg. Co.  
Van Dorn Electric Tool Co.**

Towson, Md.

**Booth No. E-101, Exhibition Hall**

The complete industrial tool lines of the above firms will be displayed at this booth including drills, grinders, sanders, screw drivers, nut runners, and so on. The exhibit will show applications for these 180-cycle units.

Among the new products are a 7-in. Super-Service Sander, a  $\frac{1}{4}$ -in. Junior Drill, and others. The 7-in. Super-Service Sander is intended for heavy duty sanding and metal finishing on a high-speed production basis, delivering high cycle performance without the wiring costs of high cycle installation. The gear construction is extra sturdy, being housed in an especially sturdy gear case. Commutator and switch compartments are sealed against abrasive dust and dirt.

The new  $\frac{1}{4}$ -in. Junior Drill is a practical, handy unit built to meet the demand for intermittent service. The housing is of aluminum and the powerful universal is especially built for this unit. A slide switch, located on top of the large, easy-grip handle, is controlled by the thumb, permitting a firm grasp of the tool at all times. Bearings are "Compo" oil-less.

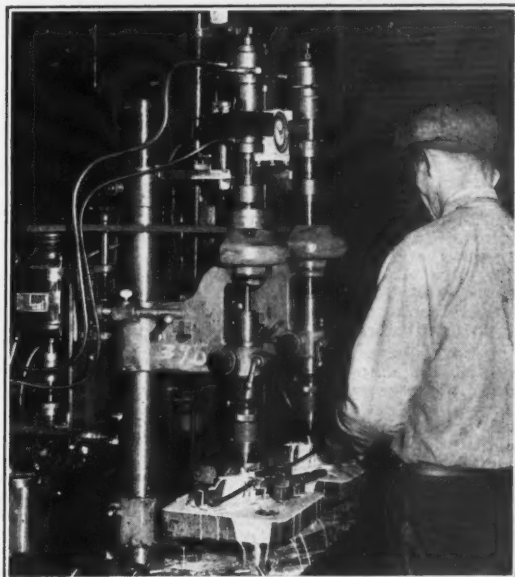
Two new High Cycle Right-Angle Screw Drivers will also be shown. Four radical positions for each tool permit use of the tool in tight corners and for continuous work without fatigue. The No. 1 unit is adapted for 3-16 and  $\frac{1}{4}$ -in. bolts and No. 8 screw, and the No. 2 unit is adapted for  $\frac{1}{4}$  and 5-16-in. bolts. Both units have adjustable clutch for uniform drive and are furnished for 110 or 220 volt, 3-phase, 180 cycle current.

A new 2-in. High Cycle Die Grinder has been added to the high cycle line. The grinder comprises a compact, lightweight unit for high-speed grinding and cleaning of dies and all types of grinder applications where accuracy and speed are required. The housing is smooth and compact; other features are sealed ball bearings, direct drive, protected thumb switch, and adjustable wheel guard. The grinder is built for 110 or 220 volt, 3-phase, 180 cycle current.

# 750 HOLES PER HOUR!

22 Hours  
a Day

Spindle Speed  
5200 R.P.M.



Automotive Parts  
Production Job at  
U. S. Pressed Steel  
Products Co.

ATLAS Drill Presses are doing real production work for the U. S. Pressed Steel Products Company, working 22 hours a day, with the spindle running at 5200 R.P.M. Week in and week out these Drills are run at this high speed practically constantly, doing an automotive parts job. What could be a stiffer test for stamina in a Drill Press? Yet ATLAS Drill presses are standing up under this and many other similar jobs and maintaining their accuracy. They will do the same in your plant. The cost is surprisingly low for such quality. Prices range from \$13.95 to \$37.95. Made in four sizes. Bench and floor models. See them at your jobber's, or write direct for descriptive catalog of these and other ATLAS Tools.

## ATLAS PRESS COMPANY

1846 N. PITCHER ST.

KALAMAZOO, MICH.

*Complete display at ATLAS SALES CO.*

35 E. WACKER DRIVE, CHICAGO

The 4-in. High Cycle Grinder is a smaller edition of the 6-in. grinder, designed for lighter weight and ease of handling. The tool is compact and well balanced. The motor, switch, and bearings are dust protected. The tool is built for production grinding with vitrified or high-speed wheels. Built for 110 or 220 volt, 3-phase, 180 cycle current.

### John Bath & Co., Inc.

Worcester, Mass.

Booth No. A-101, Arena

This exhibit consists of the full line of Bath standard and special high speed steel ground thread taps and thread gages, high speed steel ground thread roll threading dies, special ground thread lead screws, and other Bath products including the Bath Super Internal Micrometer and Master Reference Ring. The micrometer measures internal diameters to 0.0001 inch.

The Bath Super Internal Micrometer is similar in shape to the plug gage. Contact with the inside of the hole being measured is made by four jaws which contact the inner surface in a straight line. These four jaws slide in dovetail slots in the body of the tool, where they are expanded or contracted simultaneously by revolving a spindle similar to that of a micrometer. A dial with graduations reading directly in tenths of thousandths is provided on



Bath Super Internal Micrometer and Master Reference Ring

the handle. Adjustments for wear can easily and quickly be made, using the Bath Master Reference Ring as the standard.

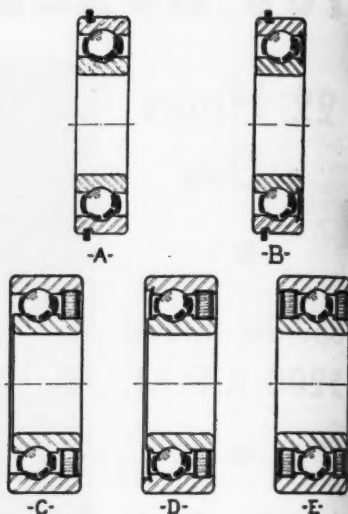
### Norma-Hoffmann Bearings Corporation

Stamford, Conn.

Booth No. A-401, Arena

The complete line of Norma-Hoffmann Precision Ball Bearings will be exhib-

ited, together with a variety of other types of precision bearings made by this firm. Included will be several bearings



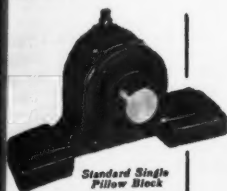
Norma-Hoffmann Bearings Designed to Reduce Machining and Assembling Time.

of types which were designed to make possible reductions in machining and assembling costs on the units in which they are used. The cross section drawings show the main features of construction of these bearings.

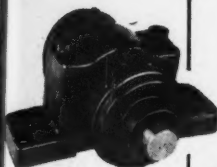
The design of the "4000" series is shown at A, the distinguishing feature of which is a snap ring of steel inserted into a groove in the periphery of the outer race close to one face. This ring eliminates one shoulder from the housing, reducing the cost of machining and providing a more compact mounting.

The "4000-P" series is shown at B. This type is similar to the "4000" series but has a side plate for the retention of grease. Three other types that will appeal to designers seeking lower production costs are the "7000" series of felt protected bearings shown at C. These are designed with a removable felt seal between metal plates. The "7000-P" series D has a single felt seal and a side plate, wholly enclosed for retention of lubricant, and the "7000" series E, is designed with two removable felt seals.

of other  
e by this  
bearing



Standard Single  
Pillow Block



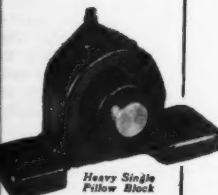
Standard Dou-  
ble Pillow Block  
with Double  
Seals



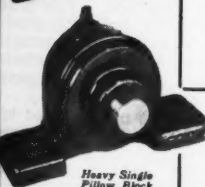
Standard Double  
Pillow Block



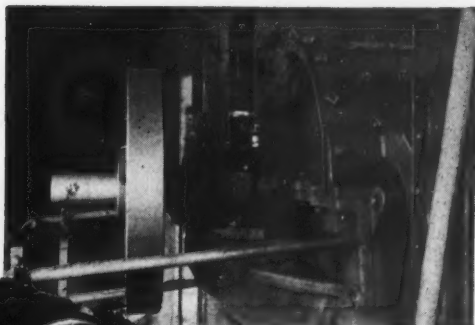
Light Single  
Pillow Block



Heavy Single  
Pillow Block



Heavy Single  
Pillow Block  
with Double  
Seals



**Where  
DUST and DIRT  
Prevail-**

## ***Fafnirs Stand the Gaff***

To pulverize the dried sludge left after the solid matter has been separated from the greases in the garbage, a Williams Crusher is used in this city garbage disposal plant. Operating 7 to 10 hours a day, six days a week, this crusher is forced to take unusual punishment because of the dirt which accumulates. Fafnir Pillow Blocks have given excellent service even though the bearings are usually covered with fertilizer made from the sludge. The standard Fafnir dust seals, consisting of two overlapping pressed steel caps, insure this dependable service as they provide a trap which effectively retains the grease and just as effectively excludes all dirt.

Whether or not the job at hand requires the exclusion of dirt, there is a correct Fafnir for every service. With the "most complete line of ball bearings in America" Fafnir is equipped to recommend the exact bearing for every industrial need. Fafnir engineers will be glad to help you select the bearing best suited to your needs... **THE FAFNIR BEARING COMPANY, New Britain, Connecticut**... Atlanta... Chicago... Cleveland... Dallas... Detroit... Milwaukee... Minneapolis... New York... Philadelphia.

WORTHWHILE economies in design and production are given in every issue of Fafnir's house organ, "THE DRAGON." We will gladly add your name to the mailing list

# **FAFNIR BALL BEARINGS**



## Fafnir Bearing Company

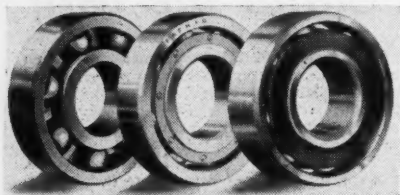
New Britain, Conn.

### Booth No. E-312, Exhibition Hall

Among the precision ball bearings exhibited at the Fafnir Bearing Company's booth will be three new types of extra precision ball bearings, designed for high speed use where extreme accuracy is required. The bearings are of the single row radial type with both rings and balls of high carbon chrome steel. Deep-groove races afford maximum thrust capacity and cushioning support under shock loads.

Standards of accuracy substantially greater than those required in S. A. E. specifications are maintained in the "M" type, now available in all standard sizes for light, medium or heavy loads. Bearings with equally close manufacturing tolerances are equipped with special bronze retainers to assure absolute concentricity in operation are also available in a wide range of sizes. This series of bearings is known as the "WW" series.

The "MM" type series of bearings, made to equally high precision standards and with even greater accuracy than the "M" type, has been developed for high speed machine applications and other special fields. "MM" type bearings are available with special composition retainers to assure the likeness in re-



Fafnir "M" Type, "MM" Type, and "WW" Type Extra Precision Ball Bearings

tainer weight that facilitates exact running balance. Standard sizes from 0.3937 in. bore to 4.3307 in. bore are offered in the light series and from 0.6893 in. to 2.1654 in. bore in the medium series are now available.

## The Fostoria Pressed Steel Corporation

Fostoria, Ohio

### Booth No. A-411, Arena

Featured in this exhibit are the Fostoria Machine Lamp, Sorwal Filter, and "Tite Seal" Joint Sealing Products.

The Fostoria Machine Lamp is avail-

able for general use in two stock styles, each employing ball and socket joints and glareless shade. The No. 32 Lamp is made with two arms, as illustrated, the base arm being 11 in. long and the extension arm measuring 10 $\frac{1}{2}$  in. The shade assembling is 10 in. over all. The No. 22 Lamp is made with a single arm



Fostoria Machine Lamp in Use

measuring 12 $\frac{1}{4}$  in. The shade assembly measures 10 in. over all. Each lamp is equipped with a bracket for attaching to the machine, wall, or table, and with a high-quality standard cord inside the lamp arms.

The Fostoria Machine Lamp is said to reduce the need for high intensity overall illumination, an intense, uniform light of fifty-foot candles or more being focused at the point where it is needed. The reflector eliminates all possibility of glare. All the light is confined and directed exactly at the point where it is needed. The ball and socket joints permit the operator to swing the light in any direction as easily as pointing his finger.

The Fostoria Sorwal Filter provides a means for successfully solving filtering problems where particles suspended in solution are to be removed. The filter is especially intended for use with grinding wheels where the grinding operations are retarded by clogging up of the wheels due to accumulation of dirty, gummy sludge in the coolant.

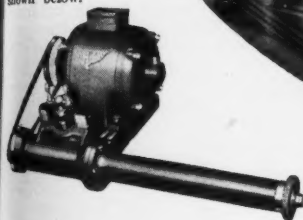
In operation, the coolant is forced by pump through a globe containing a special non-metallic filtering material which thoroughly separates all particles of metal or abrasive.

"Tite Seal" Joint Sealing Products



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2 Lamp is  
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ngle arm.

AT RIGHT—A 3 H.P. Wide Range Precision Grinder with EXTERNAL Grinding Head. Also made in eight other sizes from  $\frac{1}{4}$  to 7½ H.P. capacity. Extra Interchangeable Internal Grinding Heads can be furnished as shown below.



AT LEFT—A 1 H.P. Wide Range Precision Grinder shown with INTERNAL Grinding Head. There is a wide selection of Internal Grinding Heads available of various lengths as well as for very small to large diameter holes.

## Your LATHE IS A PRECISION GRINDER

**E**ITHER internal or external—your boring mill too—and planer and other machine tools in your shop are now capable of precision grinding of rolls, surface plates, bearings, journals, mandrels, cutters, etc. They require merely a HISEY Wide Range Precision Grinder attached to their regular tool holding fixture.

For various classes of work there are a number of sizes and types for production grinding as well as for those thousand and one odd grinding jobs which crop up in every shop or tool room.

Matched Precision Ball Bearings with pre-load and an unique lubrication system insure an accurate running spindle at any practical speed with minimum attention.

The V Belt Drive affords the most efficient and economical speed and permits quick speed changes as required.

Driven by powerful constant speed motors (not Universal) the same wheel speed is maintained under any load within their rated capacity, producing a steady uniform grind.

Catalog 45-M Giving Full Details on Request

**THE HISEY-WOLF MACHINE CO.**

"It's High Grade  
If Hisey Made"



Established 1896  
CINCINNATI, OHIO, U.S.A.

**Electric TABLES GRINDERS CUTTERS**



comprise a variety of sealing compounds especially developed for a variety of uses. The feature of "Fiber-Form" Tight Seal is its non-hardening, non-cementing, and non-solvent characteristics. It consists largely of asbestos fiber, thus it can be pressed into cavities and crevices where it strongly grips the surfaces and assures a one hundred per cent joint surface contact. "Fiber-Form" Tight Seal is non-solvent in water, oil, steam, alcohol, glycerine, ammonia, formaldehyde and many other acids and alkalis.

Light-weight type seal is especially blended for fine machined joint service. It is extensively used in aeronautical, automotive, and other types of internal combustion engines. Its elastic, viscous nature prevents oil from working through seams or joints. It is non-solvent in gasoline and petroleum products, thereby proving satisfactory and safe when used for gasoline pumps, carburetors, and so on. Other forms of "Tite Seal" Sealing Products are intended for use on automobile tops, fabric and leather seams, and similar purposes.

### The Hydraulic Press Mfg. Co.

Mount Gilead, Ohio

Booth No. 1014, North Annex

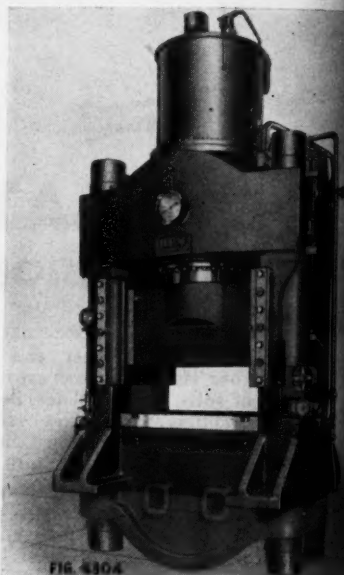
An improved line of H-P-M Hydro-Power Fastraverse Presses will comprise this exhibit. The current models continue the basic principles of the H-P-M Press, together with many new features and details which contribute to efficiency, safety and economy of operation. The H-P-M Hydro-Power Fastraverse Press is self-contained with direct electric motor drive. The hydraulic circuit provides for direct pressure connections between the source of pressure and the press cylinders, without intervening valves. All press movements are controlled by the output of the H-P-M Radial Pump.

The H-P-M 4R Radial Pump—a high speed, rotary, radial plunger type with variable, reversible stroke—has been developed especially for fast, heavy duty hydraulic press operation. The pump stroke may be sustained at full stroke position in either direction, or at any intermediate point, or neutral, as required in the press operation.

The H-P-M "Fastraverse" Control provides means for the rapid advance and return movements of the press ram with maximum economy of power and time. Communication between the overhead oil supply tank and the main cylinder is controlled by a "Floating Poppet" surge valve which is built into the cylinder.

The press is reversed in the minimum time without shock due to a device for decompressing the oil in the main cylinder immediately following the attainment of peak pressure.

The H-P-M Press Travel Control represents the "brain center" of the H-P-M system, providing means for controlling the press either automatically or manually. Automatic operation of the press is accomplished with the aid of the



H-P-M Hydro-Power "Fastraverse" Press  
Pressure capacity, 1500 tons. Bed area, 72 inches

H-P-M Hydro-Electric Control. When set for semi-automatic operation, the program stops at the initial position at the end of each cycle. With full automatic the same cycle is repeated, restarting each time automatically. An auxiliary oil system is provided for continuous circulation of the oil for its conditioning and for lubrication, also for providing pressure to operate the radial pump control. These functions are all fulfilled by a pair of small auxiliary pumps built into the main cylinder and driven from its shaft.

Two types of press frames are included in the H-P-M Hydro Power line. These are the open rod type and the

August, 1938

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the H-P-  
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ld of the

YOU ARE INVITED TO VISIT OUR EXHIBIT AT THE MACHINE TOOL SHOW IN CLEVELAND, SEPTEMBER 10TH TO 21ST. BOOTH E-400.

IN ADDITION TO CHUCKS SHOWN IN THIS EXHIBIT, SKINNER CHUCKS ARE ALSO SHOWN IN OPERATION OR AS ACCESSORIES IN THE FOLLOWING EXHIBITS:

### HAND OPERATED CHUCKS

THE ACME MACHINE TOOL CO.  
BROWN & SHARPE MFG. CO.  
THE CARLTON MACHINE TOOL CO.  
THE CINCINNATI MILLING MACHINE CO.  
GISHOLT MACHINE CO.  
THE GOSS & DELEEUEW MACHINE CO.  
THE HEALD MACHINE CO.  
THE HENDEY MACHINE CO.  
JONES & LAMSON MACHINE CO.  
KINGSBURY MACHINE TOOL CORP.  
LEHMANN MACHINE CO.  
THE MONARCH MACHINE TOOL CO.  
NORTON CO.  
PRATT & WHITNEY CO.  
REED-PRENTICE CORP.  
THE THOMPSON GRINDER CO.  
VAN NORMAN MACHINE TOOL CO.  
THE WARNER & SWASEY CO.

### AIR, OIL HYDRAULIC AND POWER CHUCKS

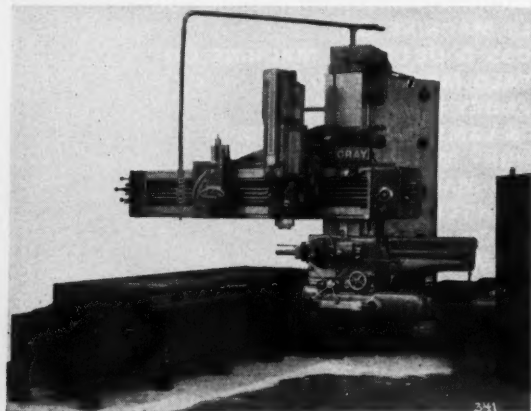
BRYANT CHUCKING GRINDER CO.  
THE BULLARD CO.  
THE GOSS & DELEEUEW MACHINE CO.  
THE HEALD MACHINE CO.  
JONES & LAMSON MACHINE CO.  
THE NEW BRITAIN-GRIDLEY MACHINE CO.  
POTTER & JOHNSTON MACHINE CO.  
THE WARNER & SWASEY CO.

## THE SKINNER CHUCK COMPANY

NEW BRITAIN, CONN., U.S.A.

closed upright, shrunk rod type. With the open rod press, the uprights serve both as tension members and as guide rods for the moving platen, which is feasible as there is no side thrust. The closed upright press has tapered gib guides, which are adjustable both front and back to maintain accurate central alignment of the ram and platen.

Each type of H-P-M press frame is available in a wide range of standard sizes varying by 12-in. increments of bed areas and also in a series of pressure capacities having the following tonnage ratings: 100, 150, 200, 250, 300, 400, 500, 600, 750, 1000, 1500, 2000, 3000, 4000 and 5000 tons.



Gray Milling Planer

## The G. A. Gray Company

Cincinnati, Ohio

Booth No. 1012, North Annex

The feature of the Gray exhibit is a Milling Planer which planes, mills, bores and drills. The machine is designed to combine the speed of a milling machine with the accuracy and simplicity of tooling of a planer. When furnished with the Gray Automatic Precision Setting Device for tables and heads, the machine is said to be highly efficient for machining all types of jigs and fixtures. The table slides on vees in the bed, thus maintaining correct alignment. The bed is twice the length of the table, thus the table is always rigidly supported. The vees, side thrust bearings, hold-down gibs and drive shaft bearings are flooded with oil from a forced lubrica-

tion system. Provision is made for quickly clamping the table slide to the bed when boring, drilling, or cross milling is being done.

The table is driven by the Gray Balanced Helical Gear Drive, the entire drive train running in a bath of oil. The cross rail is designed for the exacting demands of heavy milling service and therefore has ample stiffness and rigidity for the most severe planer service. The weight of the rail milling head is carried by spring-loaded anti-friction rollers which relieve the guide ways of all weight.

The milling heads are individual units, each being driven by its own motor. This arrangement provides flexibility of operation and permits running two or more heads at different speeds simultaneously. The milling heads are built in sizes ranging from  $7\frac{1}{2}$  to 50 h.p. Spindle motors are of the A.C. two-speed type, mounted concentric with the spindle and transmitting power directly to the spindle through planetary gearing. This arrangement affords 18 spindle speeds in geometric progression from 10 to 500 r.p.m. Speeds are changed at the head by simply turning a crank. Spindles run in double-opposed preloaded anti-friction bearings. Rail milling heads may be furnished either swiveling or non-swiveling. The swiveling heads make it possible to bore, drill or mill at an

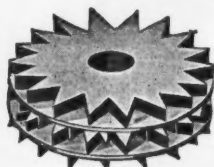
angle without tilting the work or using special cutters. Either planing side heads or milling heads or combinations or both can be furnished, in either the quill or bar type. The quill type side head regularly affords 10 in. axial spindle feed and has 18 changes of speed. The length of axial bar feed is usually 24 or 30 in., but can be made to suit individual requirements.

Standard milling feeds for the table, rail heads and side heads are from 1 in. to 60 in. per minute. The standard range of power down feed and up feed of rail heads is  $\frac{1}{4}$  in. to 15 in., and in-and-out feeds to side heads are from  $\frac{1}{4}$  in. to  $7\frac{1}{2}$  in. These feed ranges can be changed to suit. Power rapid traverse in any direction for table and heads is supplied. Power for feeding the table or heads when milling is obtained from an adjustable, direct current motor

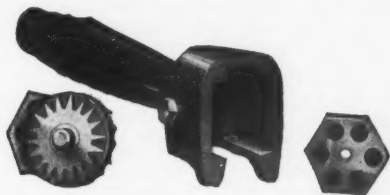
## Modernize and Economize with DESMOND DRESSERS-SIMPLEX VISES



The Desmond Diamo-Carbo Dresser. The best all-around tool room dresser.



No. 0 Desmond Cutters. We make all types and sizes of cutters.

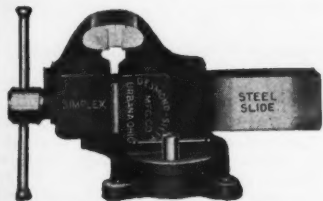


The Desmond-Hex Dresser. The most durable mechanical dresser made.



Desmond Diamond Hand Tool. We furnish all sizes of diamond tools and nibs in regular or special holders.

We manufacture the only complete line of wheel truing tools and will be glad to advise the proper dresser for your wheels. Any of our dressers—diamonds excepted—will be sent to you for trial without obligation or expense. Most mill supply dealers stock Diamond Dressers and Cutters and we will gladly furnish you with name of nearest dealer.



### SIMPLEX STEEL SLIDE VISES

The exclusive solid steel slide used in these vises, makes them stronger and more serviceable at no extra cost. Replace your worn out vises with these stronger and safer vises.

### DESMOND-STEPHAN MFG. Co., Urbana, Ohio

Send me Catalog "M" and complete information on Dressers and Vises.

Name .....

Position .....

Firm .....

Address .....

which also provides the feed for the planer heads when planing.

Table and heads can be set with great precision for boring and drilling by the use of the Gray High Speed Precision Setting Device. This device is built into the machine and must be ordered with the planer. It makes possible the production of interchangeable work without the use of jigs or fixtures.

When functioning as a planer, the operation of the machine is similar to that of the regular Gray Maximum Service Planer, with the addition of further refinements and conveniences. For instance, the table can be "jogged" or started automatically from the pendant station without touching the usual tumbler. In fact, the tumbler has been replaced by switches that operate as reversing switches when planing and as feed limit switches when milling. Every possible safety precaution has been included. Safety devices are provided for all feed and power traverse mechanism. It is impossible to engage the automatic feed of table or head when the cutter is not running and it is also impossible to stall the cutter in the work as the feed is automatically thrown out before the spindle motor is seriously overloaded.

### Illinois Tool Works

Chicago, Illinois

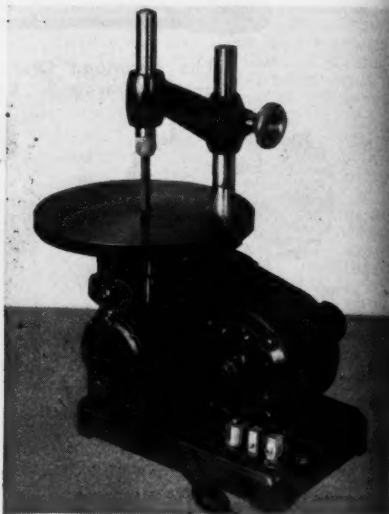
Booth No. 303, North Annex

The items on exhibition in this booth include the following machines of "Illinois" make: Die Filing Machine, Involute Profile Measuring Machine, Normal Pitch and Space Measuring Machine, Gear Charting Machine, Helical Lead Measuring Machine, Hob Tooth Profile Measuring Machine, Lead Tester for Hobs, Cutter Testing Fixture, Shakeproof Lock Washers, Shakeproof Tapping Screws, Shakeproof Special Stampings.

An interesting feature of the exhibit is the new Illinois Die Filing Machine. The machine is motor driven, using a  $\frac{1}{4}$  h.p., A.C., 110 volt, 60 cycle, 1750 r.p.m. motor equipped with cord and switch. Drive is by V-belt, providing two speeds of 450 and 600 strokes per minute respectively. The length of the stroke is  $1\frac{1}{2}$  inches.

The table, which is 12-in. diameter, can be tilted in either of two directions to an angle of 20 deg. A bushing which fits into a hole in the center of the table can be removed to provide clearance for large files, saws, or stones. There is  $6\frac{1}{2}$  in. of clearance between the center of the table and the over-

arm. The overarm can, however, readily be removed to handle large work. The base is 14x18 in., height to top of table,  $12\frac{1}{2}$  in., height to top of overarm, 25 in. Any type or size of file can be used that can be held in a  $\frac{1}{2}$ -in. chuck. The weight of the machine is 125 lbs. All



Illinois Die Filing Machine

movable parts of the machine are oiled by a forced lubricating system, so designed that the oil takes up the impact of the spindle and insures a smooth-running machine.

### Federal Products Company

Providence, R. I.

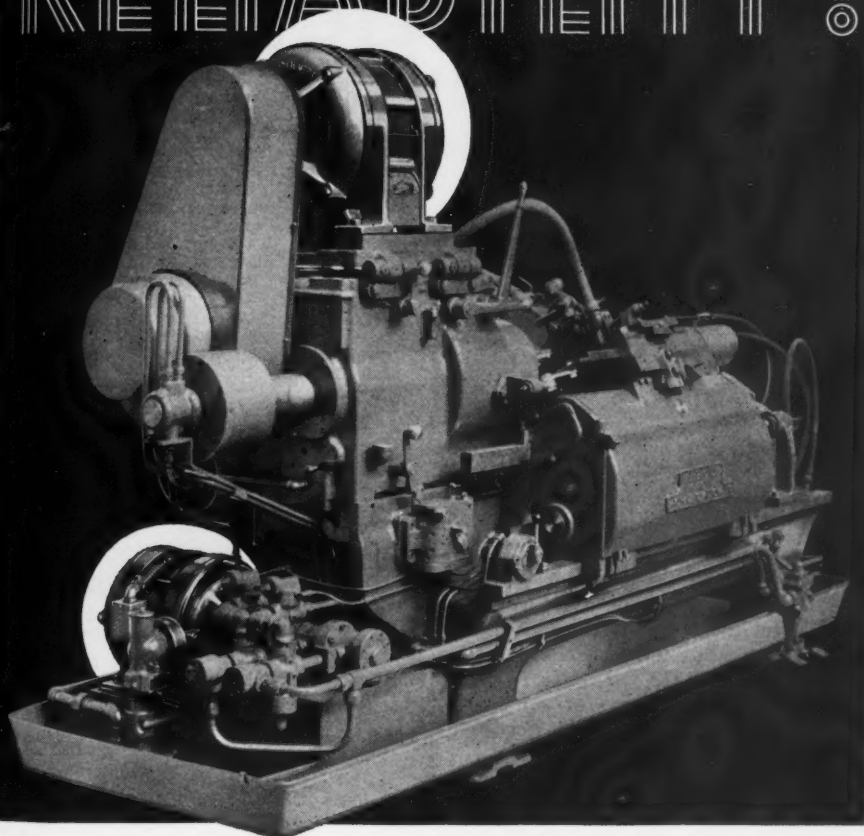
Booth No. E-502, Exhibition Hall

Included in the exhibit of the company above named is what is undoubtedly the largest dial indicator that has ever been built. This indicator was specially constructed for Franklin Institute. The indicator is 13 in. in diameter and the face is transparent so that the working parts can be seen. The large size of the indicator is striking when a comparison is made with the two normal-size indicators shown on either side of the large one.

All parts of this large indicator are perfect duplicates of similar parts in the standard instrument, enlarged proportionately, and the instrument operates



# RELIABILITY!



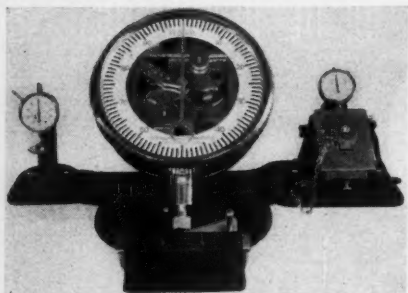
**U**NFALTERING reliability and perfect functioning are essential to the coordinated high-speed operation of this LeBlond automatic lathe, designed for using cemented carbide tools to their limit... that is why it is driven, throughout, by Allis-Chalmers Motors. • Speed... in cutting, feeding, traverse approach for the tools, quick return of the carriages; that means high production — but only if the operation is maintained without interruption. • All the production gained by high speed is lost if a shut-down occurs. • Allis-Chalmers Motors assure continuous operation, because their steel construction supplies the necessary strength to give unfaltering reliability under high speed and heavy duty. • The Allis-Chalmers Manufacturing Company builds standard motors of every type from one horsepower up, and special motors to meet every requirement.

# MOTORS

ALLIS-CHALMERS MFG. CO.



MILWAUKEE, WISCONSIN



**Largest Dial Indicator Ever Built**

in all respects in the same manner as the standard dial indicator.

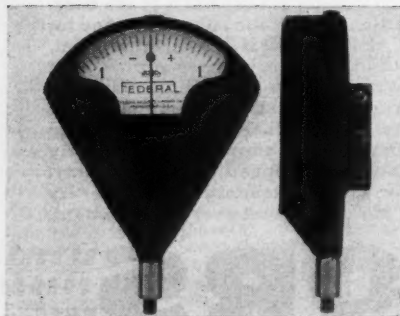
Among the precision measuring instruments and indicators of the regular "Federal" line which will be on exhibition will be the new Model 866 "Clear Vision Type" indicator, so-called because the limited dial engages the vision quickly and thus expedites operations. The indicator is highly accurate so 0.0001 in., the lines on the dial actually being 0.097 in. apart. Sturdy construction is also a feature of this instrument.

### **Baker-Raulang Company**

Cleveland, Ohio

#### **Booth No. E-212, Exhibition Hall**

The outstanding piece of equipment in this exhibit will be the new 5-ton "Hylift" truck which is now being built by the Baker-Raulang Company. The appearance of this new truck is entirely in keeping with the modern trend toward clean design and the elimination of all sharp angles and unnecessary com-

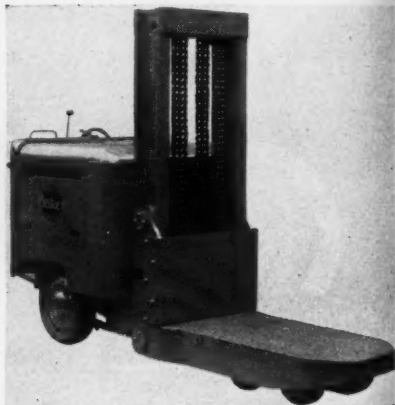


**"Federal" Model 866 Indicator**

ponent parts by placing all of the control and operating mechanism possible within the battery compartment enclosure.

Hoisting is accomplished by two double alloy steel roller chains, each having a capacity of 46,000 pounds, giving a factor of safety of 9.2 at this point. The hoist unit is a quadruple-reduction spur gear unit with all gears of heat treated alloy steel and having all shafts either ball or roller bearing mounted.

The uprights are 10-in. cast alloy steel channels with 1 1/4-in. thick web and flanges. The platform is fabricated of 1 1/4-in. high-carbon steel lift arms and carriage electrically welded to a diamond-pattern platform plate, and the platform rollers are of heat treated and ground alloy steel, 7 1/2 in. in diameter,



**Baker-Raulang 5-Ton "Hylift" Truck**

mounted on ball bearings.

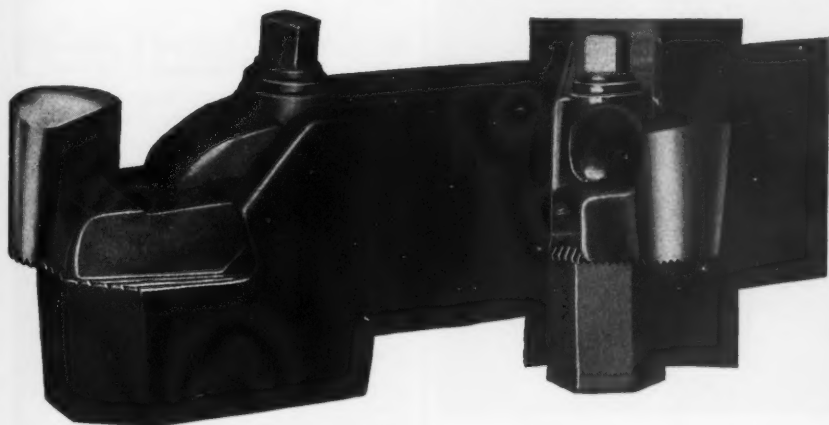
The main frame is of 1/2-in. flame-cut high-carbon steel plate with adequate cross members extending from the operator's end of the truck to the uprights. The under-frame is built up of two 1 1/4 x 5-in. and two 3/4 x 5-in. high-carbon steel plates. The dual trailing axle is of alloy steel and is fully compensating, allowing the truck to ride over road obstructions without danger of tipping the load.

The steering gear is of the worm and wheel type, actuated by a vertical hand wheel. All clevis connections are fitted with needle bearings, which allows the truck to be handled with ease under full load.

The power axle is the usual Baker worm drive unit, and is silent under

# AFTER 2 YEARS OF HARD-BOILED TESTING

*Another O. K. Success!*



IN response to a wide demand from the users of O. K. Inserted-Blade Milling Cutters, we developed these new single-point tools and, well over two years ago, placed them out on test. They were subjected to hard and varied, run-of-shop work. No favor was shown; usually the reverse! In point of performance and bit stock economy, they gave a brilliant account of themselves and are now standard in the O. K. line. If you visit the Machine Tool Show, it will be well worth your while to examine them at Booth A 313.

The Serrated\*  
BLADE ADJUSTMENT  
So Successful in O. K. In-  
serted-Blade Milling Cut-  
ters. MAY NOW BE  
HAD IN O. K. LATHE,  
SHAPER AND PLANER  
TOOLS.

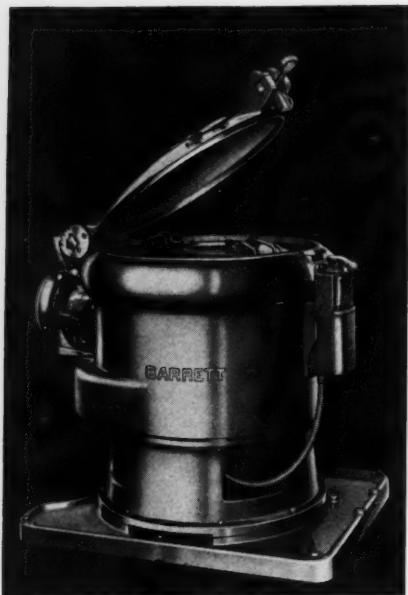
*See Us at Booth A 313, Machine Tool Show, Cleveland,  
September 11-21*

THE O. K. TOOL CO., SHELTON, CONN.



# SYSTEM

OF INSERTED-BLADE METAL CUTTING TOOLS



**"If** we stopped running our Barret Oil Extractor for one month, extra cutting oil purchases would more than double what we paid for our machine" . . . says a Machine Tool Builder.

**You** can reduce cutting oil expense in your plant as high as 90% with a Barret Centrifugal Oil Extractor. Write for literature and be sure to see Barret Centrifugals at the Cleveland Show in

**BOOTH A-408**

**THE LEON J. BARRETT CO.**  
CENTRIFUGAL MACHINERY  
RESEARCH AND EN-  
GINEERING

Worcester

Mass., U. S. A.

all load conditions. The Duplex Compensating Suspension holds the axle in perfect alignment while allowing it to move freely in a vertical direction, avoiding transmitting road shocks or twisting strains to the frame or steering mechanism. Both the travel and hoist motors have an overload capacity of 300 per cent of the rated load for 30 minutes.

### Ford Motor Company, Johansson Division

Dearborn, Mich.

Booth No. A-201, Arena

This exhibit will consist of a variety of sets of Johansson Gage Blocks, Mounting Holders, Straight Edges, Sine Bars, and other gaging accessories.

The Standard Johansson Gage Block Set consists of 81 blocks, with which 120,000 different size gages can be made, in steps of 0.0001 inch. The surfaces of the blocks are flat and parallel within 0.00001 inch, and the blocks can be "wrung" together to form a combination of blocks with an accuracy equal to that of a solid block. In spite of the extraordinary adhesive power of the blocks, they can easily be separated by a simple sliding movement.

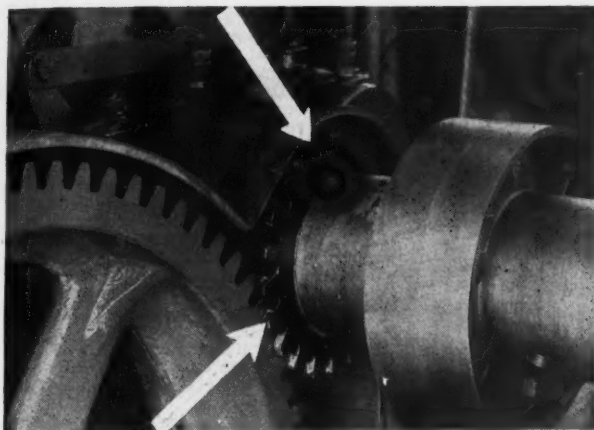
The great advantage available through the use of these blocks is that they furnish a practically universal standard of



Johansson Gaging System Set No. 1.

gaging, since parts, gages, templets, or tools made in America and checked with Johansson Gage Blocks will check the same in any other part of the world. The composition of the blocks is such that they are long-wearing and are little affected by ordinary changes in temperature.

# Quiet the Drive *with a* Formica Gear!



For noisy drives a Formica gear is a remedy that is being applied by more and more machine users, as well as machine manufacturers.

Formica is non-metallic and Formica gears purr as they turn, without a trace of the grind and screech that sometimes make metal to metal contacts trying.

Formica gears for maintenance or production purposes are cut and sold by the gear cutters mentioned. They can give prompt service on one or many gears.

## THE FORMICA INSULATION COMPANY

4632 Spring Grove Avenue, Cincinnati, Ohio

# FORMICA

## NON-METALLIC GEARS

### FORMICA GEAR CUTTERS

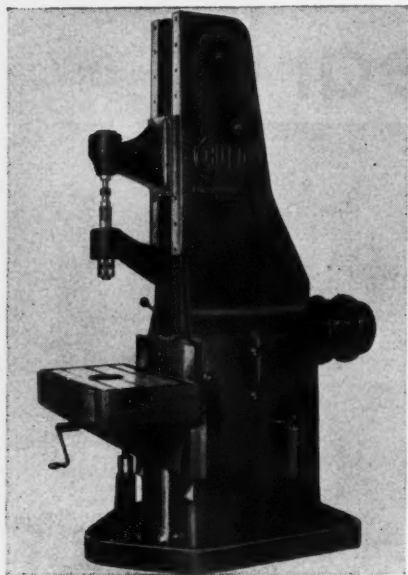
The Akron Gear & En'g Co., Akron, Ohio  
Farrel-Birmingham Co., Inc., Buffalo, N. Y.  
Slaysman & Company Baltimore, Md.  
Harry A. Moore Bangor, Me.  
The Union Gear & Mch. Co., Boston, Mass.  
The Atlantic Gear Works New York City  
Chicago Rawhide Mfg. Co. Chicago, Ill.  
Perfection Gear Company Chicago, Ill.  
The Mechanical Specialty Mfg. Co., Chicago, Ill.  
Merkle-Korff Gear Co. Chicago, Ill.  
Chicago Gear Company Chicago, Ill.  
The Cincinnati Gear Co. Cincinnati, Ohio  
The Horsburgh & Scott Co., Cleveland, O.  
The Stahl Gear & Mch. Co., Cleveland, O.  
The Master Electric Co. Dayton, O.  
The Adams Company Dubuque, Ia.  
The Ferguson Gear Co. Gastonia, N. C.  
Hartford Special Mch. Co. Hartford, Conn.  
Beatty Machine Works Keokuk, Ia.  
The Generating Gear Co. Milwaukee, Wis.  
Badger State Gear Co. Milwaukee, Wis.  
Precision Machine Co. Milwaukee, Wis.  
E. A. Pynch Co. Minneapolis, Minn.  
Joaquin Alemany Lopez Havana, Cuba  
New Jersey Gear & Mfg. Co., Newark, N. J.  
J. Morrison Gilmour 151 Lafayette St. New York City  
Sier-Bath, Inc. New York City, N. Y.  
E. M. Smith Machine Co. Peoria, Ill.  
The Eagle Gear & Mch. Co., Philadelphia, Pa.  
Rodney Davis and Sons Philadelphia, Pa.  
The Pittsburgh Machine & Supply Co. Pittsburgh, Pa.  
Standard Gear Co. Pittsburgh, Pa.  
H. W. Honermon & Son Providence, R. I.  
Perkins Machine & Gear Co., Springfield, Mass.  
Winfield H. Smith, Inc. Springfield, N. Y.  
Alling Lander Company Sodus, N. Y.  
Charles E. Crofoot Gear Corp'n, S. Boston, Mass.  
Arlington Machine Co. St. Paul, Minn.  
Farwell Mfg. Co. Toledo, Ohio  
Diefendorf Gear Corp. Syracuse, N. Y.  
Worcester Gear Works Worcester, Mass.  
Massachusetts Gear & Tool Co., Woburn, Mass.

**Hutto Engineering Co., Inc.**

Detroit, Michigan

**Booth No. 22A, North Hall**

The Hutto exhibit will include a new vertical-type honing machine, a gear lapping machine, and an assortment of the



**Hutto "V-300" Series Vertical, Single-Spindle, Honing Machine**

various types and kinds of hones made by this firm. The "V-300" Series vertical spindle single-base Hutto crank-reciprocated honing machine which will be the feature of the exhibit is complete with a hydraulically-controlled variable-speed mechanical rotation drive, and a variable hydro-mechanical reciprocation drive for providing a harmonic reciprocation motion, thereby assuring straight as well as round bores.

The machine is equipped with a hydraulically actuated mechanical "lift-out" for withdrawing the hone from and inserting it into the bore. The machine is absolutely flexible in design, making it instantly adaptable to any length and diameter of bore within the capacity of the machine. Rotation and reciprocation speeds are independently adjustable, making possible any combination of speeds required.

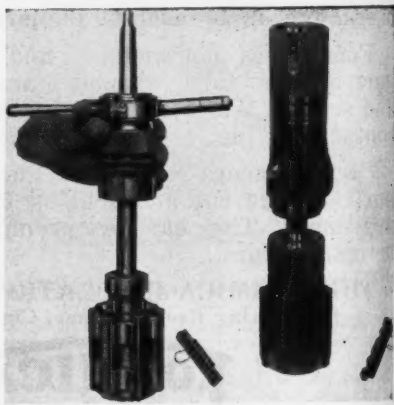
The reciprocating mechanism, al-

though hydraulically powered, is truly mechanically-actuated through a crank-type stroking mechanism. Its speeds are infinitely variable through adjustment of a feed control valve located convenient to the operating station. Any desired spindle stroking action may be obtained without shock as deceleration and acceleration are automatically produced at the extremities of the stroke.

Hones included in the exhibit are of both the manually-controlled and automatic types. The Model KKLF Automatic Type Hone, shown at the right in the illustration is intended for finishing, on a high-production basis, cylinders that have been precision-bored. The segmental members of the hone consist of abrasive stones and fiber sections. The abrasives are for the purpose of removing stock from the bore, whereas the fibers act as guides and to eliminate marking by the stones as the hone is withdrawn from the bore. They also serve to equalize wear on the stones.

The well-known "Hutto" automatic drivehead expands and contracts the stoneholders as the hone passes through the piloting and actuating bushings which are used in high-production work. Of particular interest is a new type of adjustment for expanding the fiber guides independently of the stone-adjusting mechanism. A turn of knurled sleeve at the top of the hone expands or contracts the fibers without affecting the stones.

The manually-controlled type of hone has been developed for honing cylinders of extreme length to a high finish. These hones are essentially the same as



**(Left) Hutto Manually-Controlled Hone. (Right) Hutto Model KKLF Automatic Hone**



# Now Fully Automatic Production Sawing at Ball-Bearing Speed!

Here is a new thing in production machine-tools . . . Automatic Sawing Machines with the weight and stamina for continuous high-speed, heavy-duty operation . . . with ball bearing construction thruout.

Faster than other saws, far faster than lathe cutting-off and less wasteful, the new MARVELS, Models 6A and 9A are capable of cutting-off gear blanks (for example) from a 6" round steel bar, at the rate of 10 per hour; or from 1½" round, 160 per hour floor to floor. And, remember, sawing means you get extra blanks instead of chips.

Fully automatic (with automatic bar pushup), these super sawing machines cut cutting-costs, speed up production lines and increase profits.



## Sawing Machines

No. 6A and No. 9A—  
Heavy - Duty Automatic  
Production Saws.

No. 8—The universal  
Metal Cutting Band  
Saw.

No. 6 and No. 9—  
Heavy - Duty, High  
Speed Saws.

No. 4B—Light - Duty  
High Speed Saw.

No. 1 and No. 2—  
Extremely low priced  
General Purpose Hack  
Saws.

## MARVEL

### AUTOMATICS

No. 6A—(Capacity: 8"x6")

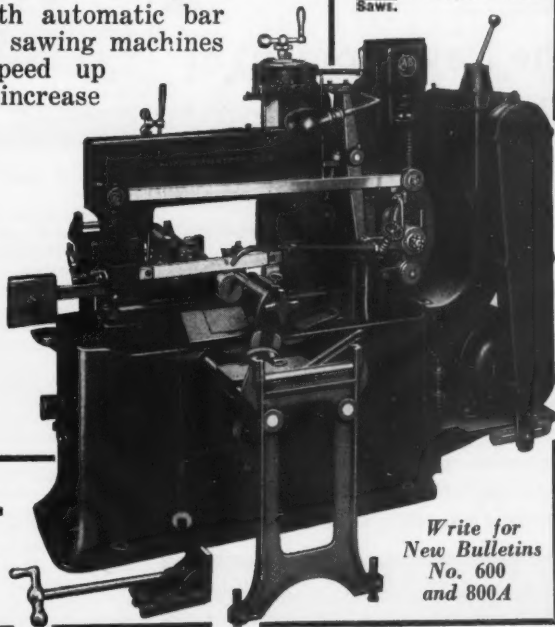
No. 9A—(Capacity: 10"x10")

Full Ball Bearing Construction.  
Combination (dual) positive  
and friction feed.

Direct connected motor elimin-  
ates belt slippage.

Quick Blade Return — shaper  
type.

New HIGH blade pressures—to  
1000 lb.—made possible by  
MARVEL High-Speed-Edge  
Blades.



Armstrong-Blum Mfg. Co.

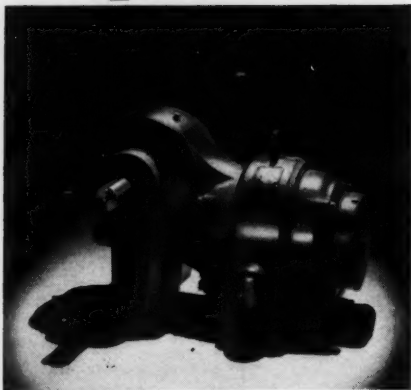
"The Hack Saw People"

345 N. FRANCISCO AVE.

CHICAGO, U. S. A.

Write for  
New Bulletins  
No. 600  
and 800A

## » Master pioneered



### the Development of Geared Head Motors

More than ten years ago Master engineers designed and manufactured the first commercially successful integrally built Geared Head Motor. Thousands of these Master Geared Head motors have since been furnished for an enormous variety of applications. The experience derived from these field operations has not only made possible many improvements and refinements in design, but has enabled Master Geared Head Motors to retain and expand their leadership until there are now more Master Geared Head power motors in service than all others combined. Let Master Geared Head Motors solve your slow speed drive problems.

**THE MASTER ELECTRIC COMPANY**  
DAYTON OHIO U.S.A.

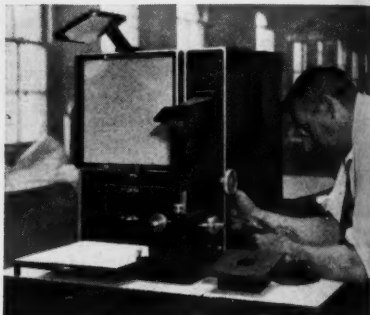
the automatically-controlled hones, with the exception that the expansion and contraction of the stones is accomplished manually by means of an adjustment provided on the drivehead.

#### **Bausch & Lomb**

Rochester, N. Y.

Booth A-309, Arena

The Bausch & Lomb exhibit will include a Toolmaker's Microscope and Accessories, BKT Wide Field Microscope, Shop Microscope, Optical Drill Gauge, Optical Bevel Protractor, Optical Comparator, Optical Glass Thickness Gauge, Optical Flats, Metallurgical Microscope, and the JM Photomicrographic Camera. Foremost in this exhibit, however, are two new measuring projectors of unusual efficiency and versatility for the



**Bausch & Lomb Contour Measuring Projector**

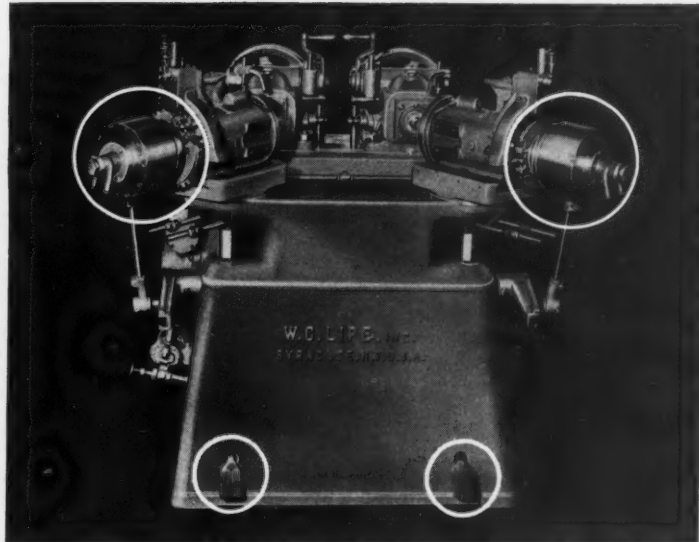
inspection of mechanical parts. Both the large and small instruments represent radical departures in design, completely new optical systems having been developed based on exhaustive studies of the application of these instruments to the tool problems of Bausch & Lomb in the manufacture of precision apparatus.

Features of the new instruments include a new light source consisting of a new incandescent lamp with practically unlimited life, a newly-designed optical system providing images free from distortion and with magnification rated on the lens system, a new horizontal table which eliminates necessity for many fixtures to hold specimens and the equal efficiency of the instruments for either visual or photographic work anywhere, without a dark room. All elements of the optical system have been designed with such relationship

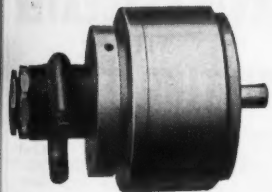
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# LIPE equips with LOGAN



Rotating Double Acting Cylinders



Foot-Operated Valves

Here is the latest Lipe Double Spindle, Heavy Duty, Gear Tooth Chamfering Machine, manufactured by W. C. Lipe, Incorporated, Syracuse, N. Y. The machine is sturdily built and has found wide acceptance due to its speed, accuracy, flexibility, dependability and long cutter life.

LOGAN equipment contributes to the production efficiency of this tool. The speed of operation runs up to 150 teeth per minute and the machine is equipped with LOGAN foot-operated valves for the actuation of LOGAN air cylinders.

LOGAN Air and Hydraulic-Operated devices not only aid many machine tool manufacturers in building dependable work-holding fixtures into their tools, but also help manufacturers in other industries to solve difficult problems.

*Put your problems up  
to LOGAN Engineers.  
No obligation.*

**THE LOGANSPORT MACHINE CO.**  
LOGANSPORT INDIANA

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that the image formed on the screen is of unusual sharpness and accuracy.

The four objectives provided with the large projector give powers of 10X, 25X, 50X, and 100X. The small instrument uses objectives of 25X, 50X, and 100X. The correction of these objectives for equality of magnification over the entire field is said to be such that differences cannot be detected by ordinary methods.

The small projector is provided with a vertical translucent screen upon which the outline of an object may be traced, and an opaque horizontal screen, formed by a small retractable drawing board, upon which paper or original drawings may be attached. The image may instantly be changed from one screen to another by the shifting of a small slide. The translucent screen may be replaced by a photographic plate or by a pair of plate glasses mounted in a book-form frame between which original drawings may be placed.

Several types of screens are provided with the large projector. The large instrument is also equipped with a Goniometer chart with a large circular screen inscribed with index lines operating in an annular bearing with graduations and vernier. The graduations are carefully numbered and spaced. The work

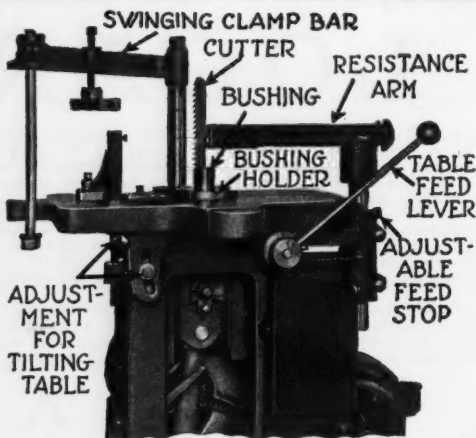
table for the large instrument is horizontal, located below and to the front of the screen. It can be moved vertically for focusing, or to accommodate objects varying in thickness. The vertical motion is governed by an automatically operated focusing device under the complete and accurate control of the operator. A number of accessories are provided for use with these instruments.

## Brown & Sharpe Mfg. Co.

Providence, R. I.

### Booth No. 27, North Hall

The Brown & Sharpe exhibit will be representative of the lines of machine tools, cutters, and miscellaneous shop equipment made by this firm. Among the machine tools will be a No. 2 Universal Milling Machine with No. 0 Universal Attachment and No. 0 Crane Attachment mounted on machine; No. 0 Slotting Machine and Tools; No. 0 Short Lead and Feed Reducing Attachment; No. 0 Omniversal Milling Machine with Universal Milling Attachment and Crane; No. 3A High Speed Universal Motor Driven Milling Machine with No. 12H Vertical Milling Attachment and Crane; No. 12 Plain Milling Machine; No. 22 Plain Milling Machine with Vertical At-



## DAVIS KEYSEATER WITH TILTING TABLE

The cutter is set up in vertical position and remains vertical during the entire cutting process. The resistance arm back of cutter is adjustable to accommodate cutters of different widths or depths, and work of various heights.

The feed is table type, operated by hand lever in connection with pinion, meshing with rack attached to table. A graduated collar on feed shaft indicates depth of cut.

For cutting taper keyways the table may be inclined in either direction from horizontal, and

a scale is provided to indicate the exact taper per foot for which it is set. This is a very important improvement over our older machines in which the table was stationary.

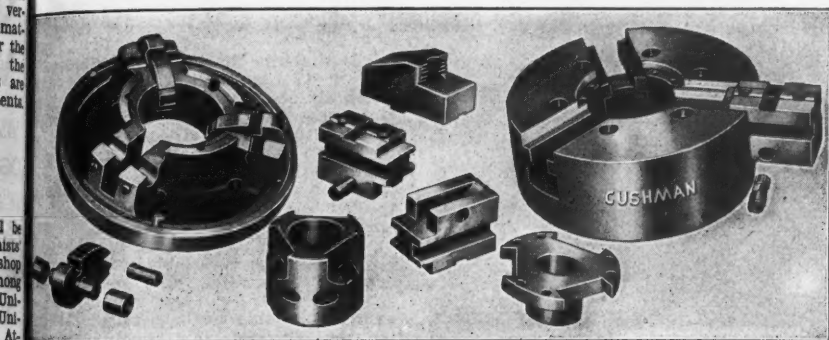
Write us for new descriptive bulletins and detailed specifications.

## DAVIS KEYSEATER COMPANY

EXCHANGE AND GLASGOW STS.

ROCHESTER, N. Y.

# CUSHMAN CHUCKS

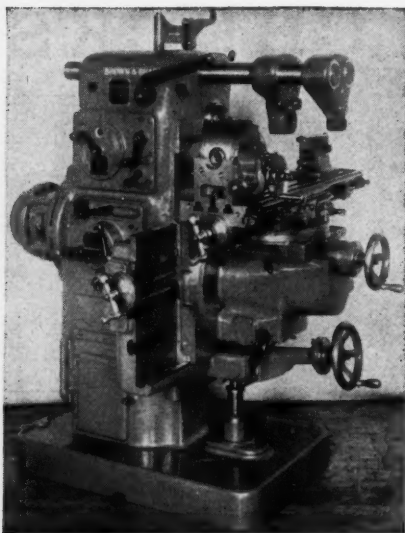


## at the MACHINE TOOL SHOW -BOOTH No. 410-E!

Visit the Cushman booth at the Machine Tool Show! See our new products! Mr. H. W. Hultgren will be in charge, and will gladly show you the following Cushman products:

1. No. 730 CUSHMATIC CHUCKS—the electric power chuck for engine and turret lathes, etc. It will be shown operating under its electrically controlled No. 70 rotating Power Unit. (Details in our bulletin No. 120-c)
2. No. 4-C-7 PULL-PUSH-POWER—the new power unit which converts rotary motion to straight line motion. An electrically operated Power Unit which will be demonstrated in action with a clevis connection on a frame designed for that purpose. (Details in our bulletin 127)
3. HAND OPERATED LATHE CHUCKS—Specimens of several Cushman light, medium, and heavy duty types. Note particularly the new standardized backs. (Details in our catalog 48)  
Get your copy of these FREE bulletins! . . . And don't fail to stop at the Cushman Booth at the Cleveland Show!

**The Cushman Chuck Company**  
HARTFORD, CONN.



**B & S No. 0 Omniversal Milling Machine**

tachment and Crane; No. 1 Standard Vertical Spindle Milling Machine; No. 2 Universal Grinding Machine; No. 32 Plain Grinding Machine; No. 2 Surface Grinding Machine; No. 5 Surface Grinding Machine; No. 13 Universal and Tool Grinding Machine; No. 00G High Speed Automatic Screw Machine; No. 0G High Speed Automatic Screw Machine; No. 2G High Speed Automatic Screw Machine; No. 00G High Speed Automatic Screw Threading Machine with Rod Magazine; No. 1 Wire Feed Screw Machine.

The Nos. 0 Omniversal Milling Machine, 12 Plain Milling Machine and 5 Surface Grinding Machine are entirely new. The No. 0 Omniversal Milling Machine has been designed primarily for toolroom and experimental laboratory use, although it will also be found valuable in manufacturing departments where the runs are too short to justify fixture expense. The machine is said to greatly surpass the conventional universal milling machine in versatility.

An easy and accurate method of obtaining simple and compound angular setting for milling and boring operations is provided and frequently a number of settings may be made without the need of relocating the work in the holding devices. Angular settings of table, in both vertical and horizontal planes, may be made with accuracy by means of

verniers reading to two minutes of arc. The sphere of the machine is greatly widened by the Universal Milling Attachment with Crane, which provides an auxiliary spindle capable of being set at any angle in both horizontal and vertical planes.

The machine has a longitudinal table feed of 17 in. and a knee saddle of 1 in., both of which are automatic. The transverse feed is 6 in. and the vertical feed is 10 3/8 in. Centers take 14 1/2 in. length and swing 10 in. in diameter.

The No. 12 Plain Milling Machine represents a radical departure from existing milling machine design, being operated through electrical controls rather than mechanical tripping. Two rates of cutting feed are available for any selected feed rate. The machine will reverse in cutting feed, making it possible upon some work to rough and finish mill in one clamping of the work piece. An automatic backlash eliminator makes it possible to rotate the cutters the same direction as the feed.

Particular attention has been given to the convenience of setting up. All adjustments can be made from the front of the machine. Four push buttons control the electric functions of the machine, governing all table movement. The table has full automatic cycle, in

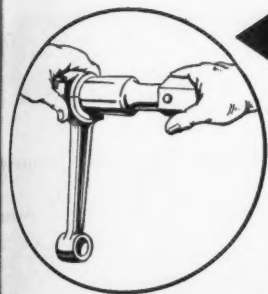


**B & S No. 12 Plain Milling Machine**

Illustrating  
being meas-

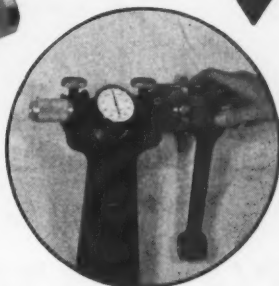
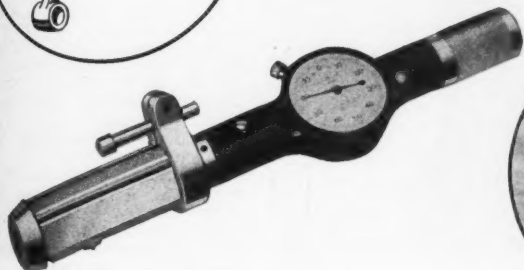
STA





***Guessing in '29-- with old-fashioned plug gages!***

***Knowing in '35 -- with the modern "STANDARD" dial plug!***



... Accuracy—in checking bores on a production basis — has been made possible, with the advent of the "STANDARD Dial Plug Gage".

By supplying visual indication of bore diameters to the ten thousandth part of an inch, this new gage eliminates all the uncertainties and inaccuracies of the "feel" system on which the user of old-fashioned plug gages depended for measurements.

The human element is definitely *out*, when the "STANDARD" Dial Plug comes in, because a positive, accurate dial reading replaces guesswork. Precise measurements can be made even by unskilled labor.

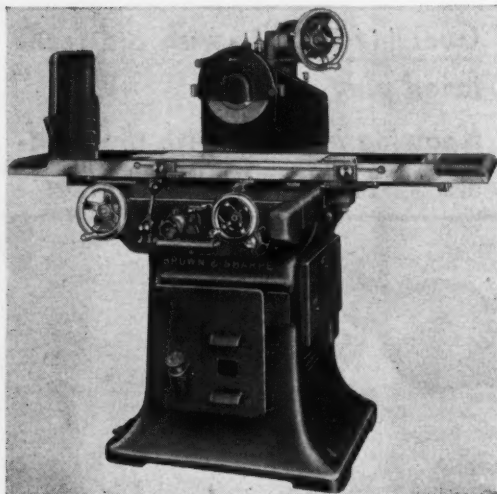
The new "STANDARD" Dial Plug measures instantly any tapered, bell mouth or out-of-round condition over the full length of the bore. Measurements are made with respect to the axis of the bore and diameters indicated on the true center line. If limits are changed, the gage can be changed accordingly.

Furnished with indicator graduated in .0001", .0005", or .001" and in Metric 1/100 mm, 1/200 mm, or 1/500 mm.

Illustrating some of the many parts now being measured with the "Standard" Dial Plug Gage.

**STANDARD GAGE COMPANY, Inc.**

Poughkeepsie, N. Y.



B &amp; S No. 5 Hydraulic Type Surface Grinding Machine

cluding power fast travel and cutting feeds in either direction.

The automatic longitudinal table travel is 18 in. and the vertical adjustment of the spindle is  $7\frac{1}{2}$  in. Transverse adjustment of spindle,  $3\frac{1}{4}$  in. The speed range includes 16 changes of from 40 to 1050 r.p.m.

The No. 5 Hydraulic Type Surface Grinding Machine is of a new design which provides an exceptionally rugged machine for surface grinding both in the toolroom and on the manufacturing floor. Particularly rigid support has been supplied for the table and the wheel spindle is carried in a vertical bearing of unusual width and length, assuring accurate alignment in all positions.

The spindle unit is of the cartridge type, easily removed for adjustment. The table is hydraulically operated, providing any desired longitudinal feed up to 60 ft. per minute and any desired rate of automatic transverse feed to 0.15 in. per reversal of longitudinal

travel. The wheel spindle driven by a  $1\frac{1}{2}$ -h.p. motor. The machine will handle work up to 24 in. long, 8 in. wide, and 11 in. high, using a wheel 11 in. in diameter.

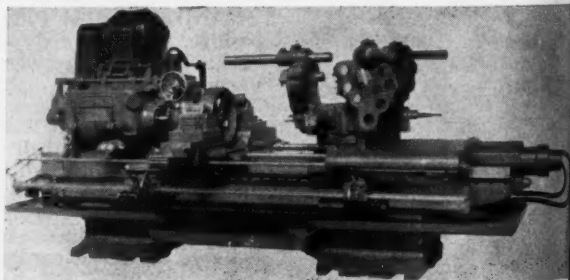
### Foster Machine Company Elkhart, Ind.

Booth No. 200, North Annex

The Foster exhibit will include a number of new machines among which will be the No. 7 All-Geared Head Universal Turret Lathe, No. 3-F Indexing Turret Type "Fastermatic", Foster  $1\frac{1}{2}$ -in. Universal Turret Lathe and Foster No. 1 Turret Lathe.

The new Foster No. 7 Universal is a ram type turret lathe of 2 $\frac{1}{2}$  in. bar capacity having 16 spindle speeds which are all dial-selected and hydraulically controlled. Any speed may be selected while the spindle is either in motion or standing idle. The dial direct reading, there are no speed plates to study, no levers to shift, no clashing of gears and no time lost.

The bed is equipped with adjustable blocks for leveling the machine and also has nitrited hardened vee ways. The automatic chuck and bar feed are hydraulically operated, a movement of single lever opening the collet and allowing the bar to be fed forward against stop. Moving the lever in the opposite direction closes the collet and moves



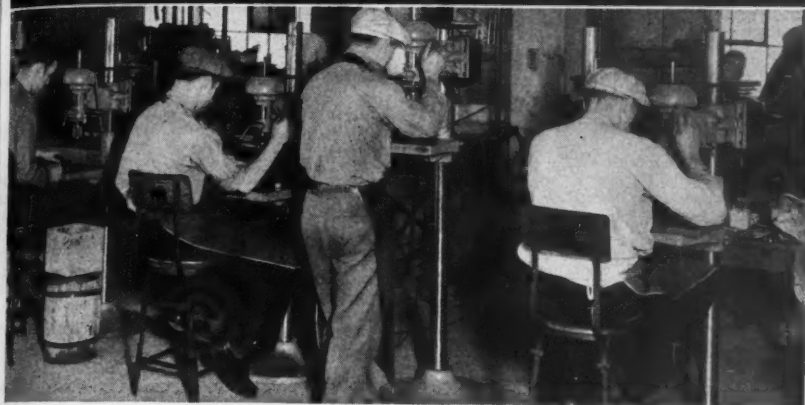
No. 3-F Indexing Turret Type "Fastermatic"

bar feed head back for the next forward movement. The cross slide is of the universal type with both power cross and longitudinal feeds. A four-station

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Any  
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## CUT PRODUCTION COSTS *with*



## DELTA LOW COST DRILL PRESSES

Priced as low as \$29.95 for the bench model, Delta Quality Slo-Speed Drill Presses are being rapidly adopted in hundreds of factories for many types of metal drilling. Their initial cost is small—yet the service they render is a revelation! Some of the largest industrial concerns in the country, after careful trials, are reordering Delta Drill Presses in large numbers. Their range of speeds enables them to be used in any general shop with drills from No. 60 up to 17/32 with utmost efficiency.

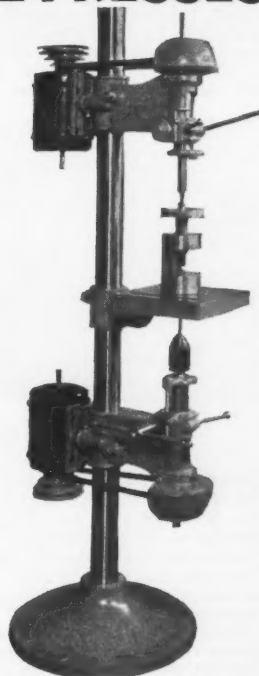
Any of the three "Slo-Speed" models, bench or floor type, can be supplied with "Delta-Grip" chuck, Jacobs Chuck, Tapping Attachment or Spindle for No. 1 Morse taper shanks. Floor model may be fitted with special production table. Write for full details about "Slo-Speed" Drill Presses and name of nearest dealer.

## EASILY ADAPTABLE FOR SPECIAL OPERATIONS

Illustration to the right shows special Delta Drill Press model adapted for special operation—this is but one of numerous instances of special adaptations of these economical quality drills.

## DELTA MFG. CO.

611 E. VIENNA AVE.,  
MILWAUKEE, WIS.



spool on the cross slide provides four power knockouts to the cross slide movement, one for each station of the square turret. The apron has nine power feeds, all selected by one dial. The feeds can be doubled by moving a lever at the head end of the machine.

The hexagon turret is automatically clamped, unclamped and indexed by the movements of the turret slide. Cross slide aprons and bearings are automatically lubricated.

The No. 3 Indexing Turret Type "Fastermatic" is designed for high productive capacity, simplicity of operation, dependable accuracy, rugged construction and low operating costs. The bed of this machine is equipped with nitrited hardened vee ways. Sixteen changes of spindle speeds are available, and arranged in four sets of four automatic changes. Any group of changes may be obtained through the levers on the floor of the machine. The machine is equipped with a bridge type cross slide and a hexagon turret.

An independent hydraulic feed is provided for each face of the turret and any proportion of the feeding movement can automatically be converted into rapid traverse movement. Fastermatics are built in four sizes each of both indexing turret and platen types.

The new Foster 1½-in. Universal Turret Lathe was designed and built to



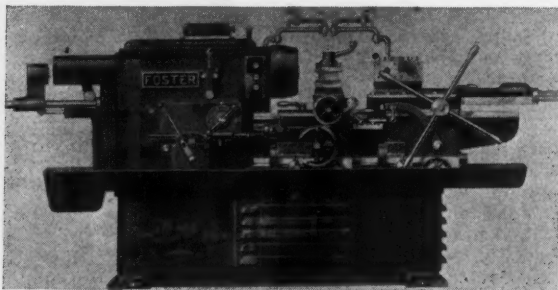
Foster No. 1 Turret Lathe

from high to low range is made through multiple disc clutches and may be made while the machine is under cut, if desired. The speeds are all dial selected.

The bed is of rigid box type construction and is equipped with nitrited hardened vee ways. The automatic chuck and bar feed are hydraulically operated, movement of the hydraulic valve lever in one direction controlling the opening of the collet and feeding of the bar for-

ward against the stop, and movement of the lever in the opposite direction closing the collet and moving the bar feed head back on the bar for the next forward movement. The cross carriage is full universal, with both cross and longitudinal feeds. An adjustable stop spool on the cross slide provides power knockouts for each station of the square turret. There are nine power feeds, all dial selected. These nine power feeds may be doubled by movement of a lever at

the head end of the machine, making 18 power feeds in all. The machine is built in 1½, 2, and 2½ in. round bar capacity.



Foster 1½-in. Universal Turret Lathe

provide a means of taking full advantage of the new cutting alloys. The machine is powered by a four-speed motor mounted in the cabinet base, driving a two-speed transmission, also mounted in the cabinet base. Power transmission is accomplished through V-belts, with eight speeds for transmission to back shaft. These speeds are doubled by the drive from the back shaft to the spindle, making 16 spindle speeds in all. The change

### Buckeye Portable Tool Company

Dayton, Ohio

Booth No. A-407, Arena

The complete line of "Hercules" Portable Tools will comprise this display

• 11¼  
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Semi-q  
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## THE NEW SHELDON 11" LATHE

● 11 $\frac{1}{4}$  in. Swing . . . Two bed lengths  
. . . 24 and 36 in. center distances . . .  
1  $\frac{1}{16}$  in. Spindle Hole.

Semi-quick change gear box with  
gears for cutting 4 to 80 threads per  
inch.

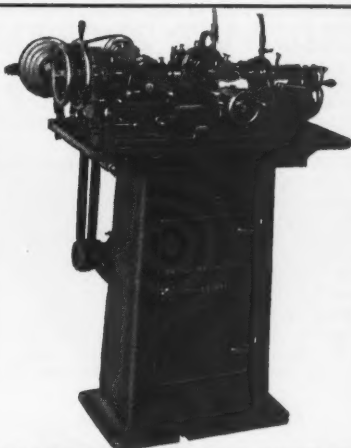
Ask for Bulletin No. 23.

### Sheldon Machine Co.

3253 Cottage Grove Ave.

CHICAGO,

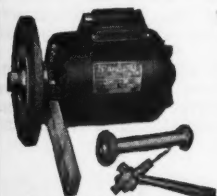
ILLINOIS



## WALTHAM THREAD MILLER

Let us explain why this machine is  
largely used for special taps, single  
and multiple worms, etc., in tool rooms  
and factories.

**WALTHAM MACHINE WORKS**  
WALTHAM, MASS.



### TOOL POST GRINDERS

$\frac{1}{4}$  h. p.,  $\frac{1}{2}$  h. p.  
6", 8" wheels

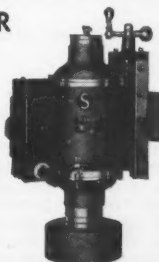
## VERTICAL ANGLE PLATE GRINDER

2 H.P. to 10 H.P. Straight face or cup  
wheels

### Combination Angle Plate Grinder

For internal or external grinding, with  
interchangeable spindles for shallow or  
deep grinding on Planer, Boring Mill  
or Lathe.

Write for Complete Catalog No. 37



### No. 50 High Speed Snagging Grinder

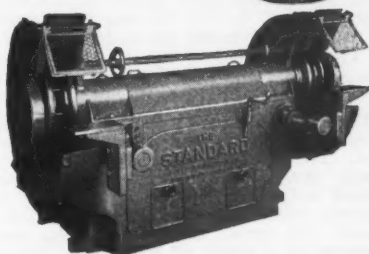
H.P.	Dia.	WHEELS		Weight lbs.
		Face	Hole	
7 $\frac{1}{2}$	20"	2" to 4"	10" or 12"	3150
10	24"	2" to 4"	10" or 12"	3776
15	30"	2" to 4"	10" or 12"	4048

Adjustable speed. Maintain 9000 S.F.P.M.  
'V' Cog Belts.

Also: GRINDERS, Bench and Pedestal. Disc  
and Ring Wheel.

BUFFERS and POLISHERS,  
Heavy Duty

DRILLS, Portable Electric



## THE STANDARD ELECTRICAL TOOL CO.

8th and Evans Sts.

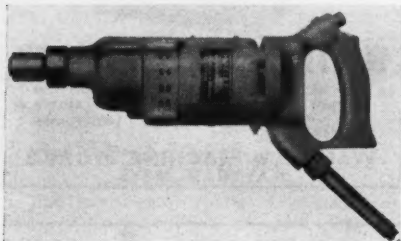
Estab. 1912

Cincinnati, Ohio

The newest tool of this line is the Hercules No. 21-S High Frequency Electric Screwdriver. This tool was designed principally for driving screws on the production line, but when fitted with an extra nut socket it is also ready for light nut running. It can be furnished with a reversing switch.

The tool is powered by a three phase, 180 cycle, 220 volt or 110 volt motor as required, built to operate at speeds of 500, 750, and 1000 r.p.m. The tool is intended for driving No. 12 or No. 14 screws, or for running  $\frac{3}{8}$  or  $\frac{1}{2}$ -in. nuts. The overall length of the tool is 15 in. and the weight is  $7\frac{1}{2}$  pounds.

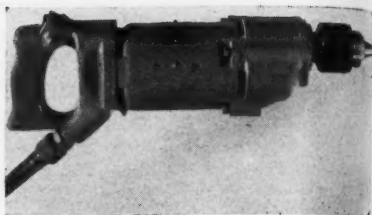
Two other comparatively recent additions to the "Hercules" line are the No. 40-N "Shockless" Nut Runner and the No. 31 High Frequency Electric Drill.



Hercules No. 21-S Electric Screwdriver

The design of the No. 40-N Nut Runner includes an adjustable clutch which tightens the nut without shock to the operator. The clutch has an adjustable releasing cam which trips it open when the nut has been tightened sufficiently. This tool is powered by a three phase, 180 cycle, 110 or 225 volt motor operating at 750 r.p.m., and is built for running  $\frac{3}{8}$ -in. and light  $\frac{1}{2}$ -in. nuts. The overall length is  $14\frac{1}{2}$  in. and the weight is  $16\frac{1}{2}$  lbs. The No. 40-N Nut Runner is available with a special left hand rotation and can be furnished with a reversing switch.

The No. 31 Electric Drill is a simple, powerful, and sturdy general purpose tool. The illustration shows it with a spade handle but it can also be furnished with side handle and switch as desired. The motor in this tool is three-phase, 180 cycle, 110 or 225 volts and operates at a speed of 800 r.p.m. Capacity,  $\frac{3}{8}$ -in. and light  $\frac{1}{2}$ -in. drill. The overall length of the tool is  $15\frac{1}{2}$  in and the weight is  $10\frac{1}{2}$  pounds.



Hercules No. 31 High Frequency Electric Drill

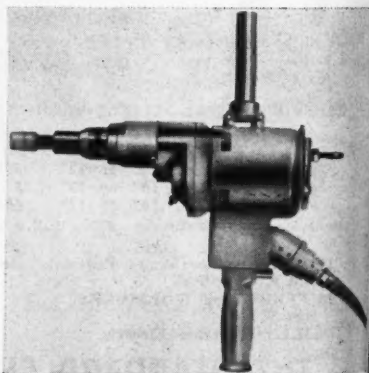
## Union Manufacturing Company

New Britain, Conn.

Booth No. A-311, Arena

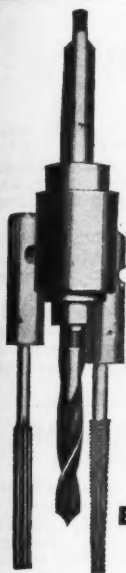
The Union Manufacturing Company products on display in this exhibit include chucks of the latest type with taper seats, new types of heavy duty independent chucks, scroll chucks, and heavy duty valve chucks. One of the features of the exhibit is the Union Electrically-Operated Chuck, especially adapted for use where great power or careful pressure control is needed, and the Union High Torque Electric Wrench. Both of these devices are operated by push button through a multiple station control box which permits a wide range of pressures. For second operation work the pressure can be reduced to a small amount, or, when full power is applied, pressures can be produced several times in excess of the hand-operated chuck.

There will also be an exhibit consisting of Union Spur Gear Hoists, Screw Gear Hoists, Differential, Acme Hand Chain Hoists, and Union 2-Wheel and 4-Wheel Trolleys.



Hercules No. 40-N "Shockless" Nut Runner





## RAPID SLIP CHUCKS and COLLETS

Rapid Slip Chucks and Collets will increase the efficiency of your Drill Presses, Screw Machines, Lathes, etc. Stopping of machine spindle to insert collet is unnecessary. Collet is held rigidly, thus eliminating whipping and wear. Fast, economical, dependable operation is assured. Write for Bulletin No. 11.

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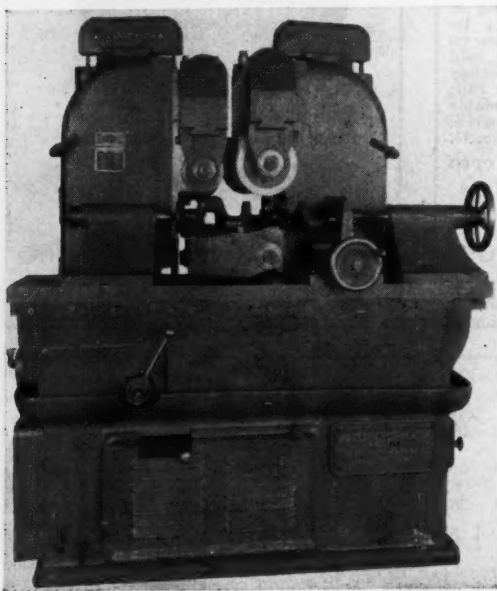
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DIAL INDICATORS . . . PRECISION MEASURING INSTRUMENTS

## New Shop Equipment

### No. 125 Producto-Matic Milling Machine

The illustration shows the No. 125 Producto-Matic Milling Machine which has been brought out by the Producto Machine Co., Bridgeport, Conn. Full



No. 125 Producto-Matic Milling Machine

automatic operation is the feature of the machine, cams controlling the table and spindle mechanisms in such manner as to feed the cutter spindles vertically and the table horizontally. The machine as shown is set up for milling six locating surfaces on an automobile crankshaft; thus the vertical movement of the cutter spindles and the horizontal movement of the table make it possible to obtain a square cut within close limits on each of the surfaces.

The two upper cutter spindle bearings move downward into the work and the lower cutter spindle bearing moves upward. These movements are con-

trolled by drum cams mounted within each of the housings carrying the cutter spindle bearings. The horizontal movement of the table is obtained through a drum cam mounted within the bed of the machine.

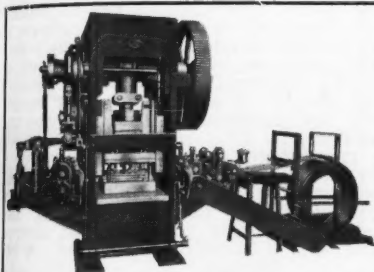
The machine is designed to mill one hundred crankshafts per hour with one operator. The overall height of the machine is 90 in. and the floor space required is 76 in.x44 in. The total weight of the machine without the work is approximately 14,500 pounds.

### Dalrae Speed Mill Attachment

The Dalrae Tools Company, Syracuse Bldg., Syracuse, N. Y., has placed on the market a high-speed milling attachment for use on milling machines and horizontal boring mills. The attachment, when mounted on the overarm of a machine, swivels in four directions and mills at any angle. Thus it eliminates the necessity for using 5, 7½, and 10-h.p. motors for cuts made with very small end mills, and provides the proper speeds for such small work, thereby producing smoother and faster cuts, decreasing the cost of power and reducing tool breakage to a minimum.

The attachment is manufactured in one size only, but it may be equipped with either ¼-h.p. or ½-h.p. motor to meet the need of the individual user. The ¼ h.p. attachment provides speeds of 500, 1200, 2500, and 4000 r.p.m., with capacity to mill with cutters of from ⅜ to ⅝ in. diameter in steel. The ½ h.p. attachment produces speeds of 350, 650, 1700, and 3000 r.p.m. and has capacity to mill with cutters of from ½ to ⅝ in. diameter in steel.

The tool is said to be well balanced for ease in mounting and setting and for safety should the head accidentally become loosened. The weight is evenly distributed either side of the overarm. High grade aluminum alloy castings are used throughout; thus the weight of



## • HEAVY STOCK •

—can be fed best with LITTELL'S high speed Roll Feeds. The No. 6 Rack and Pinion Roll Feed shown herewith handles stock  $\frac{1}{4}$ " thick x 12" wide, from coils weighing up to 1200 lbs. It is mounted on brackets to facilitate changing of dies; and is equipped with an Eccentric Operated Scrap Cutter, Power Driven Straightener, Oiler, and Power Driven Reel.

Write for further facts to:

**F. J. Littell Machine Co.**

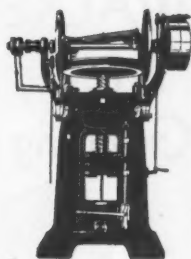
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Mfrs. of Punch Press Feeds and Reels

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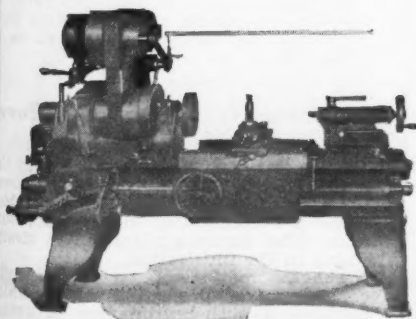


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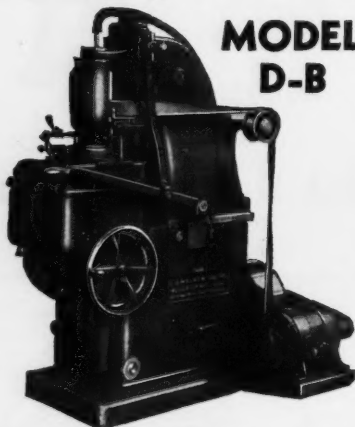


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see the

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**Provides Ample Power,  
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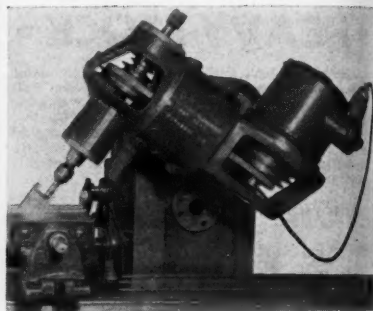
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NEW Walker Magnetic Chucks  
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**O. S. WALKER CO., Inc.**  
Worcester, Mass.

the  $\frac{1}{4}$ -h.p. attachment is but 66 pounds and that of the  $\frac{1}{2}$ -h.p. attachment is 86 pounds complete. The spindle housing, main swivel and motor mounting are all contained in one casting, providing rigidity of construction and reducing the possibility of chatter to the minimum.

The spindle pulley, which provides a fly wheel action, weighs 5 pounds and is housed between three sets of ball bearings. The spindle is of  $3\frac{1}{2}$  per cent nickel steel, hardened and ground and with a No. 7 B. & S. taper. A re-



**Dalrae Speed Mill Attachment**

versing switch provides for right and left-hand cutting. Rigid mounting is insured by four steel wide-surface gripping pads and a yoke which is not split. Squaring surfaces and a graduated scale provide for ease and speed in setting the attachment.

The standard attachment is built to fit a  $4\frac{1}{4}$ -in. milling machine overarm, but adapters for smaller diameters, for rectangular overarms, and for horizontal boring mills are available.

The attachment is equipped with a draw-in rod which is so designed that it pushes the collets out as well as it clamps them in.

### **Improved No. 2 "Economy" Power Hack Saw**

An improvement has been made in the design of the No. 2 "Economy" Power Hack Saw made by W. Robertson Machine & Foundry Co., 56 Rano St., Buffalo. The motor application is clearly shown in the illustration.

The automatic stop on this machine consists of a projecting finger which contacts a push-button type of switch and stops the motor, as well as the

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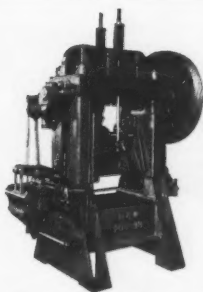
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**Machine Tool Show**

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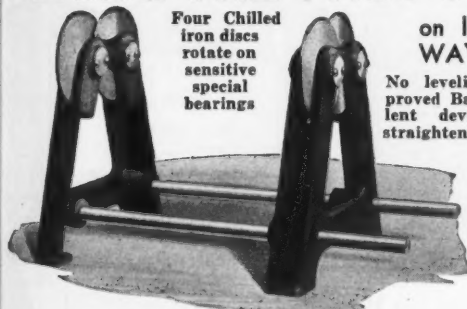
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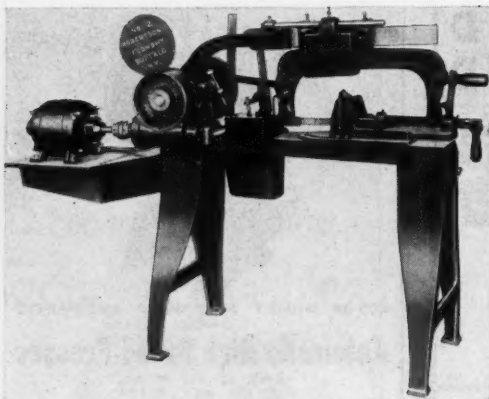
Swing	Greatest Distance Between Standards	Capacity in lbs.
20 in.	20 in.	1,000
40 in.	30 in.	2,000
60 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000

Write for complete information

**ANDERSON BROTHERS MFG. CO.**

1926 KISHWAUKEE ST.

ROCKFORD, ILL.



Improved No. 2 "Economy" Power Hack Saw

frame, thus eliminating necessity for clutch mechanism. In the new design the worm gears are totally enclosed and run in an oil bath with a gland at the shaft end. The motor is connected to a worm shaft through a smooth type flexible coupling, reducing operating

noise to the minimum. All frequencies of electric current are taken care of through the use of but two sizes of worm gears.

The capacity of the machine is 6x6 in. with a 6-in. stroke and it takes blades from 12 to 14 in. in length. The machine swivels to 45 deg. for cutting at angles. The machine is equipped with a hydraulic ram which relieves the blade tension of back drag and positively prevents the frame from falling on the work.

### "Thiel" Precision Band Saw

The Thiel line of precision die and punch making machinery marketed by Marburg Brothers, Inc., 90 West Street,

New York, N. Y., has been increased by the addition of a high speed precision band saw machine for internal sawing of dies and other work, where accuracy and speed are important.

The rigid yet simple design of the machine is clearly shown in the accompanying photograph.

Be sure this  
Mark  
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You Purchase

It is  
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ITIVE ASSUR-  
ANCE of accuracy,  
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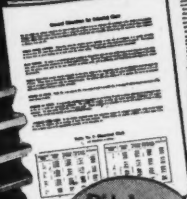
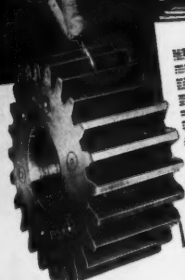
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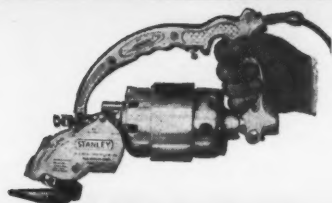
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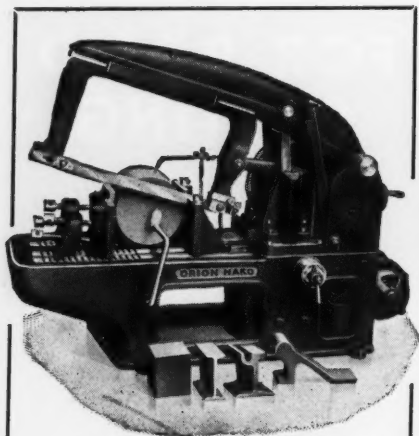
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## ORION

### Hydraulically Controlled Power Hacksaw

5 Sizes, from 6" up to 16"

Entire sawing cycle automatic,  
with automatically controlled feed  
pressure.

No vibration, no chattering, and  
thus no breakage of saw blades.

Straight saw-cuts thruout life of  
machine; no waste of material  
through deflection of saw blade.

Stationary or movable types.

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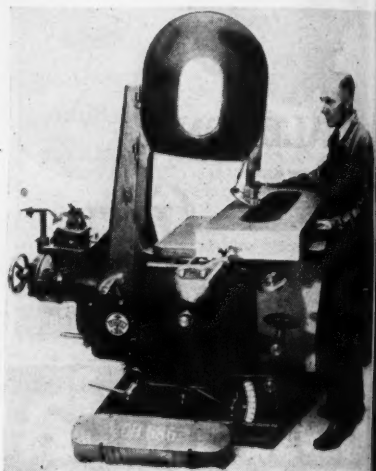
**MARBURG BROTHERS, INC.**

90 West Street

New York City

panying illustration. Two sizes are offered for sawing material up to 8 in. and up to 10 in. in thickness, with tables 20x20 in. and 30x26 in. (or even larger if desired) and weighing 880 lbs. and about 1700 lbs. respectively. The illustration shows the larger one of the two machines. The drive is obtained from a single electric motor with a plain starting switch. The smaller machine has four speeds, and the larger one has eight.

Standard open end band saws are used.



"Thiel" Precision Band Saw

about 9 ft. and 12 ft. in length, respectively, and of a wide variety of teeth and widths. When doing internal sawing, one end of the saw is inserted in the pre-drilled hole of the die and both ends are then quickly joined by means of the electric brazer attached to the machine. The brazed endless saw band is placed on the two sheaves, both of which are easily accessible from the front; it is at the same time inserted through a slot in the table and the top sheave is tightened by means of an adjusting screw so as to obtain proper tension. If a band saw should break, it is quickly repaired or replaced, the operation requiring only a minute or two. A change from one width of saw to another requires but little time, so that each job can be done with the width and type of saw best suited for it.

The well-known Thiel automatic feeding device is incorporated in these ma-

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chines, enabling the operator to concentrate on guiding the sawing operation.

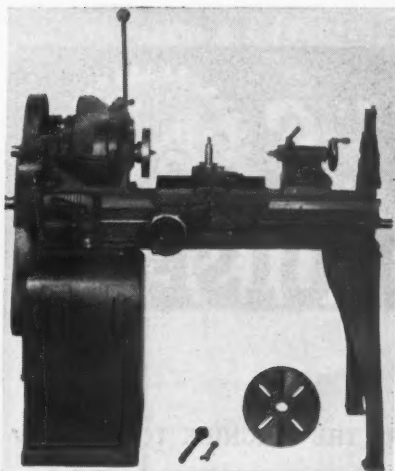
The sheaves are mounted on ball bearings, and the saw is securely guided by saw guides above and below the work. The table on the smaller machine may be tilted and accurately adjusted in four directions. The larger type has the unique feature of a column which can be tilted, with the table remaining in a horizontal position. This is an important feature, when very heavy dies or other heavy work are to be sawed at an angle.

Air pump and hose for blowing off chips and also an adjustable electric lamp are standard equipment.

### Sebastian 12-In. x 4-Ft. Lathe

The Sebastian Lathe Co., Cincinnati, Ohio, has placed on the market the 12-in. x 4-ft. lathe shown in the illustration. The lathe swings 12¼ in. and the distance between centers with the tailstock flush is 22½ in. A 1⅝-in. hole extends through the spindle. Swing over the carriage is 8¾ in., with a collet capacity of ⅞ in. The feed range is .008 in. to .252 in.

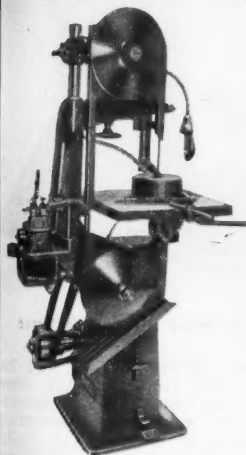
The head stock is of the cone head type with six speeds and a back gear.



Sebastian 12-in. x 4-ft. Lathe

All gears in the apron, quick-change box, and reverse plate are of steel. The reverse plate is adjusted and set so that when it is thrown from right to left

## "THIEL" No. 17 Precision High Speed Bandsawing Machine



The universal bandsaw for accurate internal and external sawing of dies, tools, etc.

Uses standard bandsaws from ⅛" up; with quick change and set-up of new bandsaws.

Saws continuously after starting, without attention to motor or control; automatic feeding device frees operator for full attention to work.

### NEW PUNCH GRINDING ATTACHMENT FOR "THIEL" No. 32 PUNCH AND FORM SHAPER

The Shaper can now be used as Punch Grinder to finish hardened and warped punches.

### "THIEL" PRECISION DIE SAWING AND FILING MACHINE

About 1000 in daily operation in U. S. A.

"Thiel" No. 17 Bandsaw

Ask for literature

**MARBURG BROTHERS, Inc.**

90 West St. New York



## AT THE MACHINE TOOL SHOW

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SYNTHANE SILENT STABILIZED GEAR MATERIAL

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CORPORATION N OAKS, PENNA.

Booth A-404



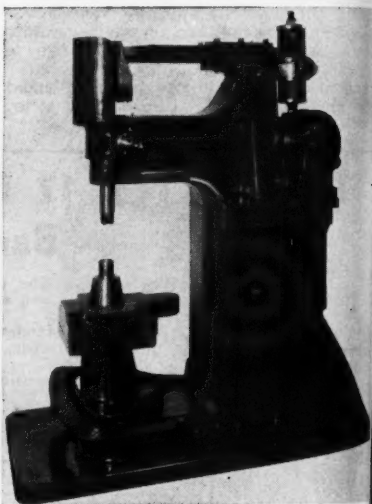
hand, the gears cannot be meshed too closely.

The lathe is powered by a motor located in the cabinet leg of the machine, a bracket at the rear of the lathe supporting a cone from which a belt extends to the headstock cone. Power is supplied to the rear cone from the motor by means of a V-belt. Starting, stopping, and reversing of the lathe are controlled through a drum type safety reversing switch, mounted within easy reach of the operator.

The machine is guaranteed accurate within 0.001 in. limit. The machine is supplied with a face plate, dog plate, steady rest and wrenches.

## No. 7B High Speed Riveting Hammer

To meet the demands of an ever-increasing field in heavy cold riveting, The High Speed Hammer Company, Inc., 307



No. 7B High Speed Riveting Hammer

Norton Street, Rochester, N. Y., has brought out the No. 7B High Speed Riveting Hammer shown in the illustration. This hammer will successfully cold head mild steel rivets of 1 1/4-in. diameter, forming oval heads in 30 seconds each and will perform the same operation on 3/4-in. rivets in 7 seconds each. On riveting flanges, a much greater diameter can be handled. The

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**CHAMPION  
EXPANDING  
MANDRELS**  
Accurate—Efficient



**CHAMPION  
PORTABLE  
VISE  
and  
TOOL  
STANDS**



Vise Stand (left) is a great convenience in any shop. Heavily built so when handle brake is set, the stand is very substantial for all purposes. Tool Stand (right). Made strong, easily movable, keeps tools and work together. We also manufacture Toolholders, Emery Wheel Dressers, Machinists' Vises.

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**PIONEER  
Centrifugal**



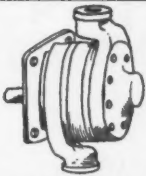
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**Good Pumps**

for handling abrasive-laden coolants—for supplying lubricants in steady, even flow—for hydraulic service in machine tool actuation. Ask for detailed Specifications.

**PIONEER Engineering & Mfg. Co. 31 Melbourne Detroit Mich.**

hammer is also capable of performing many operations of swaging and forming.

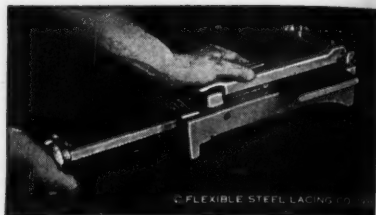
The No. 7B High Speed Riveting Hammer is of heavy construction, weighing approximately 5,000 lbs. The machine has a horizontal gap of  $14\frac{1}{2}$  in., is 74 in. high over all, and occupies a floor space 28x64 inches.

### Alligator Belt Cutter

An 8-inch flat belt cutting tool which employs a new principle in mechanical belt cutting is announced by the Flexible Steel Lacing Company, 4607-31 Lexington Street, Chicago, Ill.

The cut is made by pushing the knife through the belt from one edge to the other. The knife is mounted on a plunger in a slot, as illustrated, and is operated easily by a direct arm push without mechanical leverage. The knife will cut the thickest and toughest belts up to 8 in. in width with surprisingly little effort. The knife, of special alloy steel, will make several thousand cuts and is easily replaceable.

The belt is held immovable by the equalizing clamp or hold down while the cut is being made. The clamp is also a guard for the blade. Clamp and



Alligator Belt Cutter

frame are strongly built of aluminum alloy, the weight of the cutter being only 4 lbs. 3 oz. The belt cutter is used on the bench, as illustrated, or may be upended on the floor.

### Productimeter Predetermined Counter

A counter that is complete in combining everything needed for recording and controlling the output of production machines is the new Pre-Determined Counter which has been announced by Durant Manufacturing Company, 1927

## SHEPARD NILES CRANES



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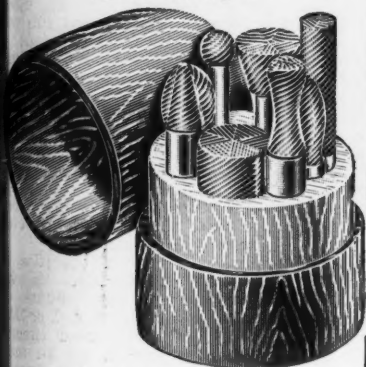
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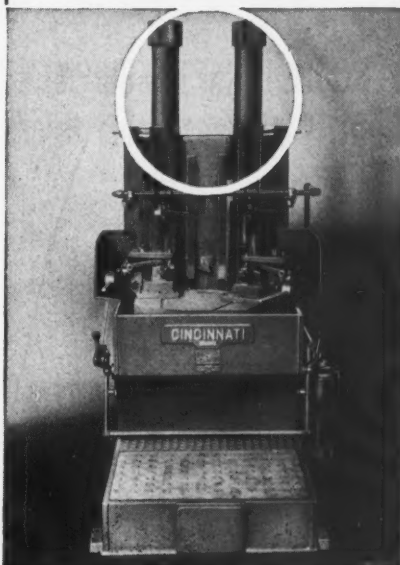
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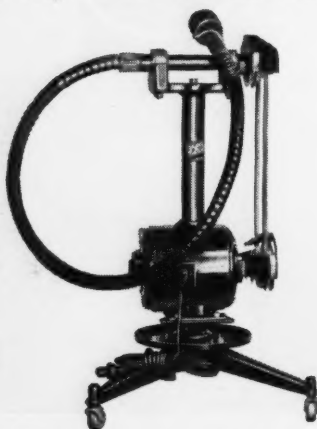
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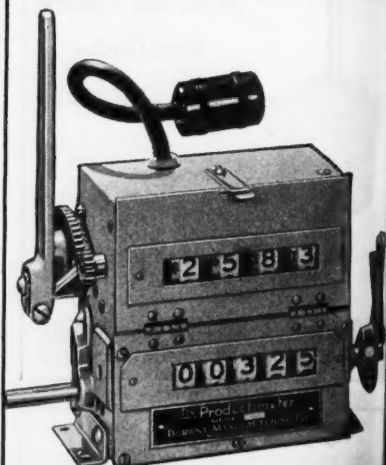
**WYZENBEEK & STAFF, Inc.**

Manufacturers

642 Washington Blvd., Chicago, Ill.

N. Buffum St., Milwaukee, Wis. This counter is available in either rotary or stroke types for attachment to punch presses, drill presses, screw machines and other machines where it is desired to keep a close control over the output. It will be found particularly useful for quick handling of short runs and for preventing over-runs and under-runs.

The distinguishing features of this Pre-Determined Counter are: (1) a lower deck that acts as a totalizer to record



Productimeter Predetermined Counter

the continuous output, (2) an upper deck which records the current run and is reset for a new run by a wingnut on the side, and (3) an extra set of numbers on metal wheels beside the large figures on white wheels in the upper deck. On this extra set of wheels can be presented any production count desired up to 9,999. When the count recorded on the upper deck reaches the preset figure an electrical contact in the counter automatically causes a bell to ring or a light to flash, or may even stop the machine, if desired.

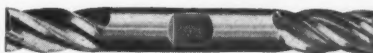
The maximum speed of operation of the Pre-Determined Counter is 40 strokes or revolutions per minute. It operates on 110 or 220 volts, A.C. or D.C. and for either open or closed circuit. If the machine is driven by an individual motor, the counter is merely wired to the starter box. For belt-driven machines an electric stop motion is available. This is hooked up with the counter so as to shift belts or operate a clutch automatically. The stop

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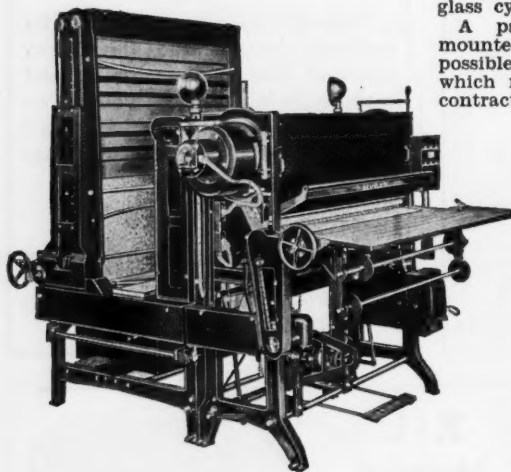
ROCKFORD

ILLINOIS

tion may be combined with a sight or sound signal that will continue till the operator resets the upper deck for the next run.

### Revolute Type 3-E Continuous Automatic Blue Printing Machine

A number of important improvements have been made in the Revolute 3-E



Revolute Type 3-E Continuous Automatic Blue Printing Machine

Continuous Automatic Blue Printing Machine made by the Paragon-Revolute Corporation, 77 South Avenue, Rochester, N. Y. The finishing unit of the type 3-E machine has been redesigned

so that the overall height of the drying unit is now only 7 ft. The mechanism for rethreading the paper through the finisher has also been simplified.

The No. 7 lamps formerly used have been superseded by No. 10 arc lamps which are reported to give steadier light and better service. The well known Revolute revolving contact feature is, of course, retained in the type 3-E machine and, as in other Revolute printers, the tracings and sensitized paper ride around the arc lamps on the revolving glass cylinder.

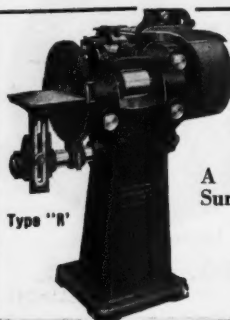
A patented paper "preconditioner" mounted in the feeding table makes it possible to subject the paper to heat which removes the moisture. Thus any contraction of the paper that might occur takes place before the paper reaches the exposing glass.

### "American Hole Wizard" Radial Drill

Higher speeds, lower drilling costs, less operating effort, and minimized maintenance are outstanding features of the new "American" Super-Speed Hole Wizard Drilling Machine which has been brought out by The American Tool Works Co., Cincinnati, Ohio. The machine is proportioned for use equipped with a 5-h.p. built-in motor, the economical drilling capacity of the machine being approximately 2-in. diameter in cast iron and 1½-in. in steel with a tapping capacity of a 2-in. tap in cast iron and

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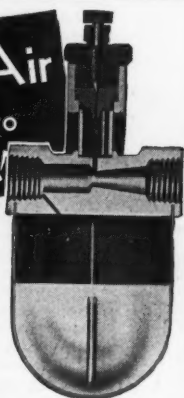
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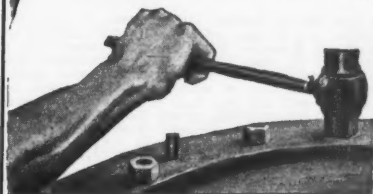
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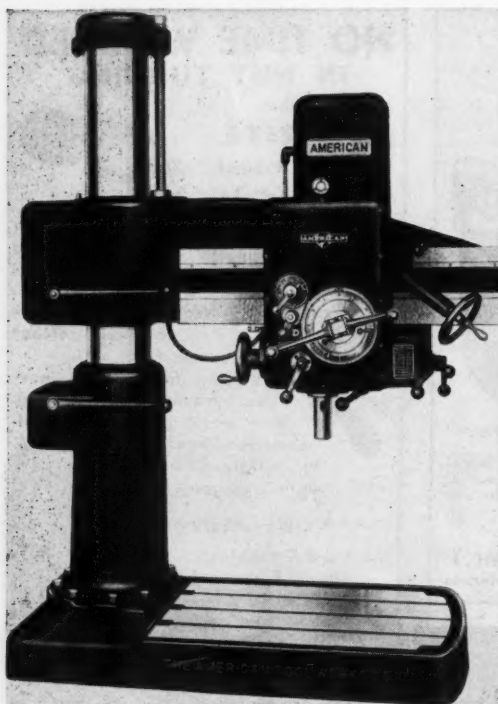
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Cannot  
Slip  
off  
Nut*



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"American Hole Wizard"

pick-off gears. If higher speeds are desired, a range of from 50 to 2200 r.p.m. or 70 to 3000 r.p.m. can be provided. These speed ranges are based upon the use of a 60 cycle alternating current motor. The entire range of 18 spindle speeds is obtained through three levers

conveniently located at the lower right hand side of the head.

For tapping, spindle reverse is available and is accomplished by means of an almost instantaneous reversing motor. The unit is guaranteed to reverse the spindle when running at the highest speed from full forward to full reverse in approximately  $1\frac{1}{2}$  seconds.

The head is mounted on two large roller bearings which rest on a hardened steel guideway located at the lower portion of the square type arm, providing the narrowest possible guide way for the head mounting. All speed changing mechanism is located within the head casting as is also the spindle feed unit, consequently both speed and feed controls are entirely from the head. All shafts are of heat treated alloy steel and are multiple splined. All gears throughout the head mechanism are made from chrome-manganese steel forgings, are double heat treated and oil hardened and each mating pair is machine lapped under pre-determined load.

The construction of the spindle assembly is said to be an outstanding achievement. The spindle is of Nitralloy steel, nitrided for extreme surface hardness, thereby minimizing wear and the danger of scoring or seizing. It is ground accurately to a slide fit in the sleeve. The spindle sleeve is also of hardened Nitralloy and is honed to size. The sleeve is mounted in Timken Roller Bearings and is provided with means for adjustment to compensate for wear.

The drive to the spindle is through

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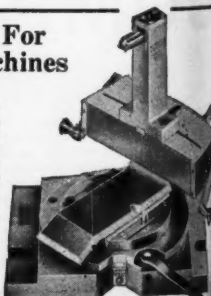
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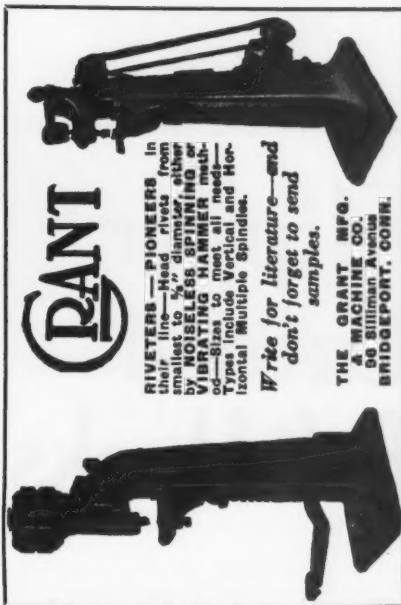


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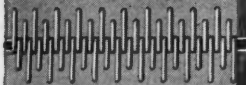
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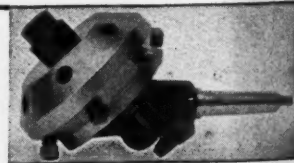


# Clipper

Belt Lacer Company  
Grand Rapids, Michigan

hardened and lapped helical gears, insuring a smooth, vibrationless power transmission. The drive occurs at the bottom of the head, which is the closest possible point to the work, and thus minimizes torsional strain upon the spindle and eliminates the possibility of chatter. Six rates of geared power feed are provided: 0.004, 0.007, 0.011, 0.014, 0.017, and 0.025 per revolution of the spindle. All power feeds are obtained through a sliding gear feed unit in which the gears are hardened and lapped and the entire unit anti-friction mounted. Provision has been made for the application of a power tap leading unit which will provide five tap leads.

The machine is built only in the motor driven type, using a modern ball bearing, rolled shell type of 5-h.p. shaftless motor. The start, stop and reversing of the motor is secured through a reversing drum controller operated by a lever located just below the head casting. Power elevating and lowering mechanism for the arm is standard equipment. This mechanism consists of a  $\frac{3}{4}$ -h.p. ball bearing rolled shell type motor and reversing drum comprising a compact unit which is located at the rear of the arm girdle. The entire unit is anti-friction mounted and runs in oil. A single lever operates the elevating unit and also automatically clamps and unclamps the arm, making it impossible to raise or lower the arm while it is clamped to the column. A plain box table is available with two large working surfaces, one horizontal and one vertical. A universal table is available for angular work settings. It consists of a standard base on which is mounted a tilting work table with two work surfaces. The face of either work surface can be set in a vertical position by means of a mechanism consisting of a segment and worm.



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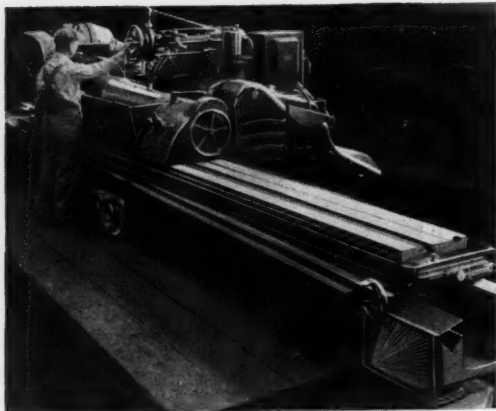
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## DIAMOND TOOLS



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### Malsack Control For Swivel Table Grinders

A new development for use with swivel table grinders, known as the Malsack Grinder Control, has been announced

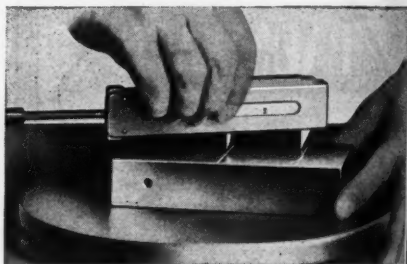
by the Systematic Company 709 S. 36th St., Milwaukee, Wis. The control is applicable to any plain or universal grinder used for cylindrical grinding, and is particularly advantageous on toolroom work where many and varied tapers are to be ground.

All grinders of the swivel table type are regularly equipped with a coarse scale at the end of the swivel table for use in obtaining an approximate setting of the table. However, the final setting is determined by the "trial and error" method which often consumes a great deal of time. When the Malsack control is used, only one cut and two measurements are required in order to obtain the correct setting for any taper.

In applying the Malsack control, the usual scale is supplemented by a dial indicator which reads in thousandths of an inch. The indicator is located at the end of the swivel table adjacent to the scale. As part of the Malsack control, a chart that has been

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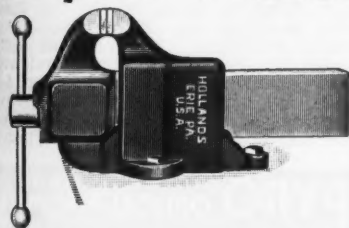
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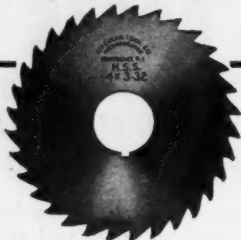
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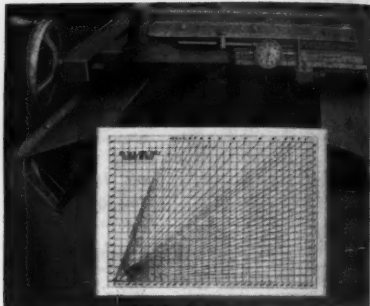
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developed from a scientifically correct mathematical formula is supplied with which the operator is enabled to make the necessary adjustment quickly and accurately.

In operation, the operator takes over the work and then takes two measurements, one at each end of the cut. He then refers to the chart and swings the table as many thousandths as the chart indicates. No computation is required.



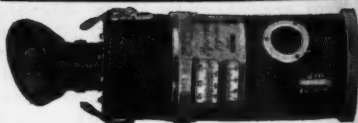
Malsack Grinder Control Applied to Grinding Machine

on the part of the operator, and if he reads the chart correctly there will be no chance for error in the setting. The control is quickly and easily applied.

### "Hisey" Motor-Driven Drill Grinder

The floor stand motor-driven drill grinder shown in the illustration has been placed on the market by The Hisey-Wolf Machine Co., 2745 Colerain Ave., Cincinnati, Ohio. The machine is designed for sharpening either straight or taper shank drills, 1-, 2-, 3-, or 4-flute drills, flat or chucking drills, flat twisted drills and drills with over-size shanks. The machine can be adjusted to provide

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Models for Wall, Bench, Punch  
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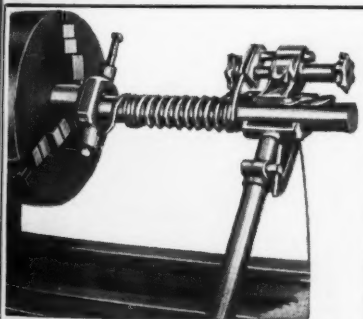
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### Parkson Improved Gear Tester

The Parkson Gear Tester, announced in the April, 1934, issue of MODERN MACHINE SHOP, has been redesigned to include a number of improvements. Compared with the earlier model, the bed is wider, deeper, and better able to support weight without deflection due to the fact that the load is now carried midway between the shears of the bed. Both the floating and the adjustable carriages are machined to the same level to accommodate special equipment for testing spiral, bevel, and worm gears.

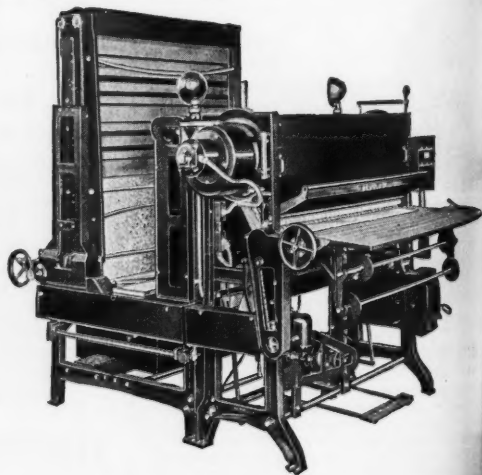
The machine as shown in Fig. 1 is set up for testing bevel gears. The gear on the vertical arbor is carried by the floating carriage and that on the horizontal

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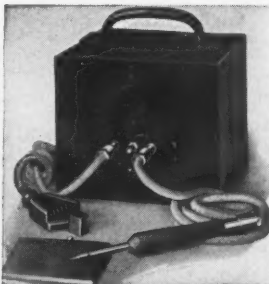
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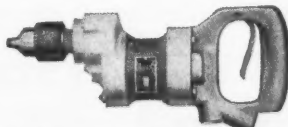
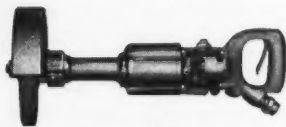
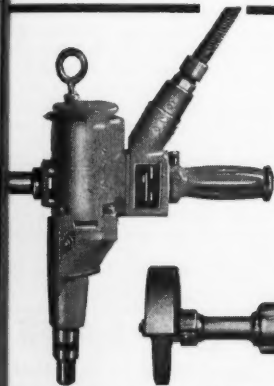
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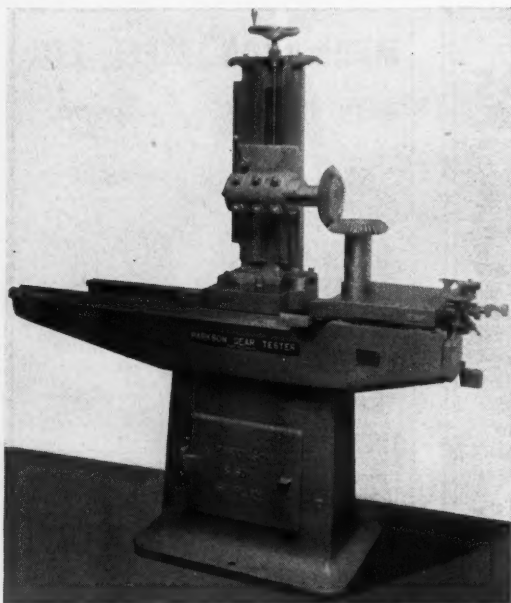


Fig. 1.—Parkson Gear Tester Set Up For Testing Bevel Gears.

arbor is carried on a saddle that may be adjusted by means of a hand screw at the top of the vertical slide. The horizontal distance from the face of the socket which carries the horizontal arbor to the axis of the wheel on the vertical arbor may be read from the scale and the vernier, and the vertical distance from the face of the boss of one gear to the axis of the other may also be read from scale and vernier on the vertical slide.

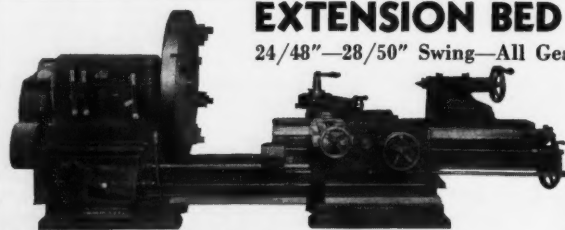
Fig. 2 shows the high center attach-

ment for spur gears, consisting of a vertical shaft mounted on the adjustable carriage on which slides an adjustable center, a corresponding center being carried in the socket in the carriage. This attachment will accommodate gears up to 11 in. dia. and 18 in. long between center points.

Spiral gears are tested by the use of the equipment shown in Fig. 3. This attachment consists of a bracket mounted on the floating carriage, accommodating pinions up to 8 in. dia. Usually spiral gears consist of a pinion and gear, and the restriction of in. dia. applies to the pinion only. There is no restriction as to the size of the gear other than the distance between the centers which is either 24 in. or 36 in.

The equipment for testing worms and worm wheels is illustrated in Fig. 4. When using this attachment the wheel is mounted on the vertical arbor on the adjustable carriage and the worm is carried in bearings or between centers on the floating carriage. A phantom view of the worm and a wheel are shown in the illustration. The brackets or bearings for the worm shaft are adjustable along a horizontal slide so the distance between them may be varied. The slide also has an angular adjustment of several degrees so that the best position for contact of the threads of the worm with the teeth of the wheel can be found. Adjustments can also be made by the screw on the vertical slide.

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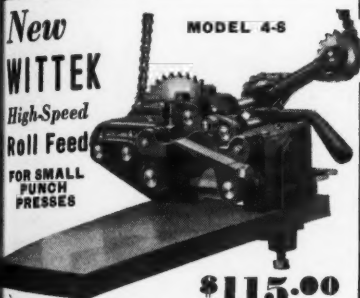
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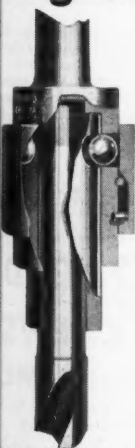
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FAIRVIEW

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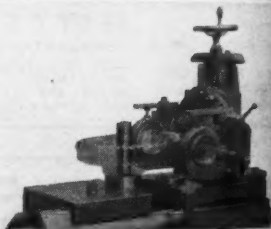
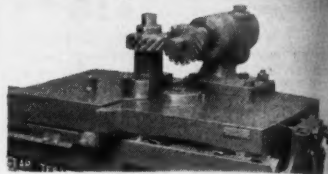
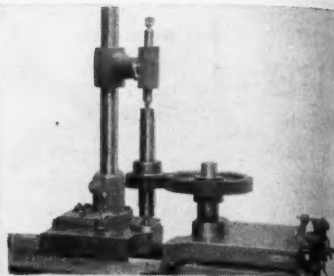


Fig. 2.—Parkson Gear Tester Set Up Testing Spur Gears With High Center Adjustment. Fig. 3.—Parkson Gear Tester Set Up For Testing Spiral Gears. Fig. 4.—Parkson Gear Tester Set Up For Checking A Worm Wheel, Which Are Shown In Phantom.

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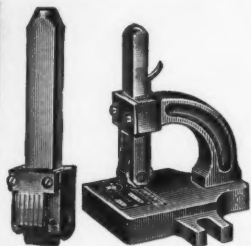
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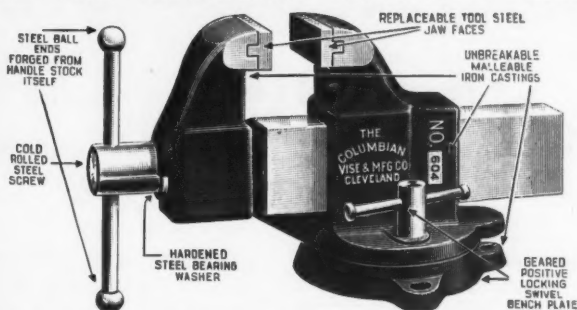
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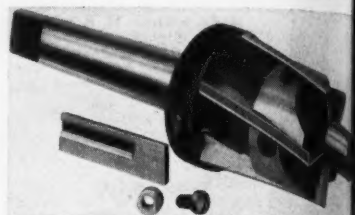
made by the use of the recording device which can be fitted to any size of Parkson Gear Tester. This device traces a line on a circular chart, corresponding with the movements of the floating carriage, thus recording in permanent form the character of the gears. Comparison between the line as drawn and a true circular line on the chart may be made. The actual errors are magnified approximately fifty times.

### Genesee Facing Tool

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The tool is made in sizes from 1 1/4-in. diameter to 3-in. diameter by 1/4-in. steps and by 1/4-in. steps from 3-in. to 4-in.



Genesee Facing Tool

diameter. Pilot sizes range from 1/4-in. on the smallest tool to 2 1/2-in. on the largest and shanks range in size from Morse Taper No. 2 on the smallest to No. 5 on the largest. The design is such that chip space in the Genesee Facing Tool never varies, no matter how much the blades are ground.

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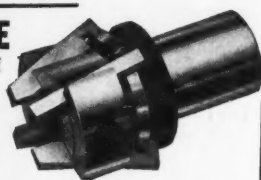
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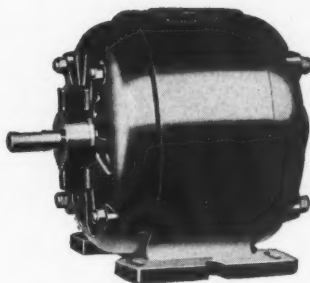
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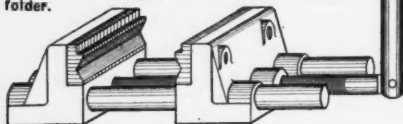
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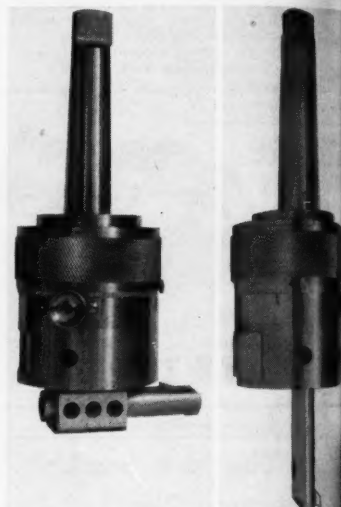


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in that radial adjustment of the carrying cross slide is brought under micrometric control of the operator either in or out, while the tool head and machine spindle are rotating and the tool is cutting. This adjustment is effected through the use of a simple sleeve which engages a rack and pinion, providing a simple, compact, and rugged design.

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A particularly valuable feature is the micrometer slip collar which can be

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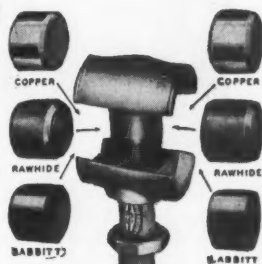
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The tool shown is made with a body  $3\frac{3}{8}$  in. in diameter by  $3\frac{3}{8}$  in. long and will hold a tool or bar up to  $\frac{3}{4}$  in. diameter. The radial travel of the tool slide is  $\frac{3}{4}$  in. The boring and facing range without extension tool block is 3 in.; with extension tool block, 12 in. The weight is approximately 9 pounds.

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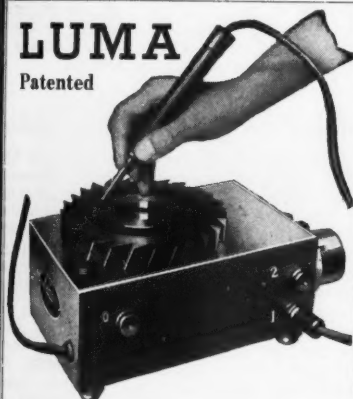
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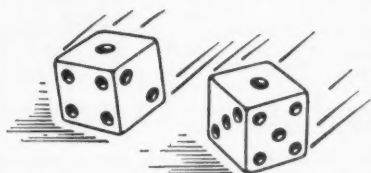
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The same skill in manufacture that has given Gorham standard cutting tools a reputation for quality insures the complete satisfaction to the user of Gorham special tools.

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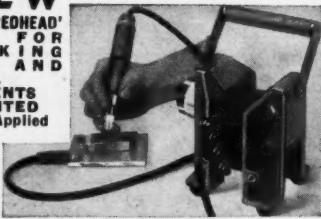
## GORHAM TOOL COMPANY

14400 Woodrow Wilson Ave.  
DETROIT, MICHIGAN

**NEW** ETCHER & DEMAGNETIZER

**'REDHEAD'**  
IDEAL FOR  
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TOOLS AND  
PARTS.  
AGENTS  
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**TAYLOR SALES** 15505 Linwood  
Detroit, Mich.

**CRALEY OFF-SET  
BORING HEAD**

No. 4 Head for  
Boring holes to  
10" diameter.



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Prices

These Boring  
Head Sets are  
made in six sizes.

**G. C. CRALEY MFG. CO., SHILLINGTON, PA.**



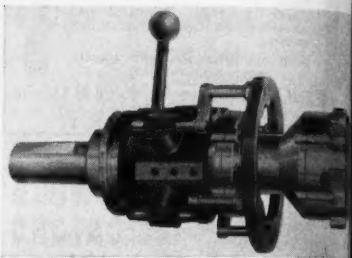
**BALL THRUST BEARINGS  
ROLLER THRUST BEARINGS  
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Special Bearings Made to Order.  
Send Sketch or Sample for Quotation.  
Catalog Upon Request

**THE G. WILLIAM CO.**  
358 Furman St., Brooklyn, N. Y.

length of link can be provided for the length of thread desired.

The link can also be used on a tap required for reaching to the bottom of a deep hole even though a short length of thread is required. If a short length



Landis Collapsible Tap with Extension Link

of thread is also to be tapped, the tap can be removed and the head attached directly to the body, making a standard tap. Taps in service can be fitted with the link if it should become necessary to use the tap for longer threads than originally provided.

The illustration herewith shows a 6LT body with 7-in. head with link to provide a reach of 6½ in. as required for tapping straight through a special pipe coupling. The application to a Style LM tap would be similar.

### Glenco Compensating Tool Holder

The line of utility tools made by The J. G. Glenzer Company, 6463-77 Ewald Blvd., Detroit, Mich. has been augmented by the addition of a tool holder which automatically compensates for machine spindle mis-alignment and thus aids in producing true or accurate tapped or reamed holes under adverse conditions.

Only 11 different parts are used in the construction of this tool and all parts are held to close tolerances, making them interchangeable and easily assembled. All parts are hardened and ground, therefore proper units will fit correctly in holders which have seen service. The shank, compensators, bushings, and certain other parts are all chrome nickel steel, accurately machined, hardened and ground. The rollers used to separate the compensator slides from end of shank and flange of float sleeve are of tool steel. The centralizing plunger is also of steel and the plunger spring is of spring



ALL ST

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Most  
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112 DA



ALL STYLES CAMS SIZES UP TO 50"  
GENEVA MOTIONS  
MADE TO CUSTOMER'S SPECIFICATIONS  
**KUX-LOHNER MACHINE CO.**  
2147 Lexington St. Chicago, Ill.

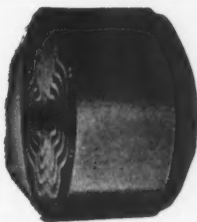
### The Mummert-Dixon Spot Facer



...enables you  
to machine ac-  
curate and smooth  
surfaces on small  
bosses, etc., in less  
time than by any other  
method. Better investi-  
gate! Send for a bulletin.

**MUMMERT-DIXON CO.** 120 Philadelphia St.  
HANOVER, PA.

## Standardize ON D & W Chucks



**S**TANDARDIZATION pays, particularly when the tool is as far ahead of its class as the D & W chuck. Oil and waterproof, it is designed and constructed to give maximum holding surface with exceptionally strong and uniform pull throughout. Cables are protected by rubber tubing — special demagnetizing switches for readily releasing the work.

Complete  
information  
on request.



**J. & H. ELECTRIC  
COMPANY**

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PROVIDENCE, R. I.

# INDUSTRIAL DIAMONDS



### WHEEL TRUING DIAMONDS

Most efficient tools supplied for each grinding operation. Durable stones only.



### DIAMOND BORING TOOLS

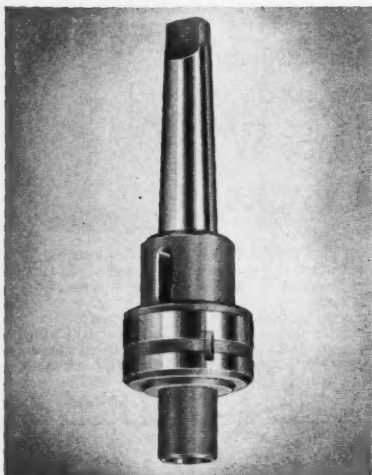
Successful results assured by superior diamond cutting plus our experienced service.

Write for Full Information

**F. F. GILMORE & CO.**

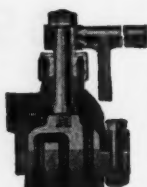
112 DARTMOUTH ST.

BOSTON, MASS.



Glenco Compensating Tool Holder

steel. The shank can be furnished in Morse or other tapers.



### 2, 3 & 4-way VALVES

For use on air, water, steam or oil for operating single and double acting cylinders, on pressures up to 300 lbs. Made in Lever, Foot and Solenoid Operated types.

*Bulletins on request.*

**W. H. NICHOLSON & CO.**  
136 Oregon St., Wilkes-Barre, Pa.

The tool is made in five standard stock sizes in capacities up to 5 in. diameter and in types to fit hand automatic screw machines, Garvin tapers, adjustable multiple spindles, and all drilling and tapping machines of all types. Special or larger holders can be made up upon order.

### "Vinco" Angle-Tangent-to-Radius Grinding Wheel Dresser

A tool with which any angle tangent to a radius can be dressed on a grinding wheel has been developed by the Vinco Tool Company, 7348 Central Ave., Detroit, Michigan.

The dresser, illustrated herewith, is equipped with a block holder that carries the short shank in which the diamond is mounted. Using a master block, the diamond is positioned on the inch from the face of the holder. The slide on which the holder is located is positioned at the required distance from the face of the wheel by the use of stops, then the angle tangent to the radius is obtained by moving the slide.

### SHORT RUN STAMPINGS

A process eliminating necessity of making expensive dies.

### ALSO PRODUCTION

### STAMPINGS

We specialize in building mechanical devices. Write for estimates.

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**GERDING BROS.**

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CINCINNATI, O.

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*New developments, by Oliver-of-Adrian*

**A NEW FULL AUTOMATIC FACE MILL GRINDER  
IN OPERATION**

**A NEW TOOL AND CUTTER GRINDER  
A NEW DRILL GRINDER FOR SMALL DRILLS**

*"Plan to spend some time with us"*

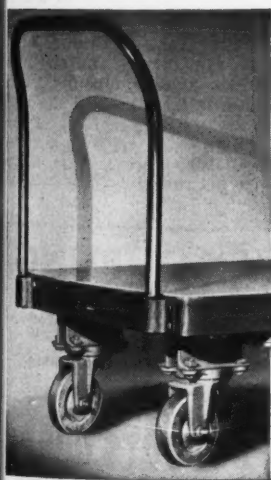
(Also Die Making Machines, Drill Grinders, Tap Grinders and Point Thinner)

**OLIVER INSTRUMENT COMPANY, 1430 Maumee St.**

**ADRIAN, MICHIGAN**

*You are cordially invited to visit  
Space 307B, the Machine Tool Show  
Cleveland Public Auditorium  
September 10-21, 1935  
Baker Bros., Inc., Toledo, Ohio*

## **BUILT** not 'adapted' **FOR SHOP USE**



When the Service Push-E-Z Truck was designed it was for the maximum requirements of shops where the heaviest castings are a lot more common than cases of canned goods or bolts of cloth. Hence, when you put a Push-E-Z to work, you'll find the difference between it, and the usual warehouse floor truck. The Push-E-Z's precision parts are themselves a machine shop product, and even the chassis is channel steel welded into one piece.

We particularly recommend a trial of the Push-E-Z for its frictionless casters (Service ball bearing with machined raceways and Hyatt roller bearing) and its Textolite Wheels. The latter are a G. E. Product, easy on the floor, yet proof against cutting by floor scrap.

You'd say "Oh, yeah?" If we told you no other truck deserves a place in your shop, but try a Push-E-Z and decide for yourself. Write for details and quotations.

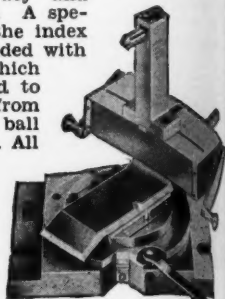
# **SERVICE**

**CASTER & TRUCK CO.**  
596 N. Albion St.  
Albion, Michigan

in either direction by means of a cross-feed handle on the end of the slide. Thus the diamond can be positioned at the center of a pivot as required, after which the radius is dressed on the wheel by rotating the entire slide, block and diamond by means of a knurled handle.

The slide is located on an index plate which is graduated in degrees, and the index plate can be set at any angle, to within minutes of a degree, by the use of a vernier. The base on which the

index plate rests is provided with standard keys for aligning the dresser with the center line. The dresser is equipped with a precision ball bearing pivot, insuring accuracy and free rotation. A special ring on the index plate is provided with a groove in which felt is packed to prevent dirt from entering the ball bearing pivot. All



"Vince"  
Grinding  
Wheel  
Dresser

parts of the dresser are hardened and ground.

**EVERY SHOP** needs these rugged, accurate, portable Pyrometers. L88 for checking Surface Temperatures: 800° range with 1 ft. silver tip couple, \$17.90. L89 for Non-ferrous Metals: 1600° range with 2 ft. couple and 1 ft. replaceable tip, \$19.30. L90 for Furnaces: 2500° range with 3 ft. couple, \$19.00. Sent on 30-Day Trial. Circular Free.

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### Hold-Heet Pyrometers



**\$16**  
COUPLES  
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LANCET  
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### SpeedWay

**NOW—Steel Bodies** . . . Lighter, stronger, handier — crash-proof, 11 other design advancements. Over-powered — a safety factor that will see you thru. Leading plants after test standardize on SpeedWay for more power, more drill, more holes, low initial cost, low upkeep.



More Drill  
for the  
Money

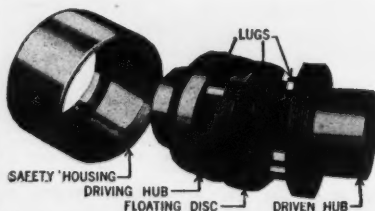
WRITE FOR  
CATALOG

**SpeedWay Manufacturing Co.**  
1825 So. 52nd Ave., Cicero, Ill.

### "Lifetime" Uniflex Coupling

The illustration shows a new self-aligning coupling which has been developed by the Alloy Products Corporation, Waukesha, Wis., for use in direct-connected drives. The coupling is self-adjusting so as to compensate for parallel misalignment as well as angular misalignment. Under test the couplings have run out of parallel alignment as much as  $\frac{1}{8}$  in. and from 3 to 6 deg. angular misalignment.

The coupling is made in four parts two of which are driving hubs. Into each hub is set two round lugs, and when the coupling is assembled the lugs fit into recesses in the periphery of the third part, which is a drive disc made of bone fiber. The recesses are made long so as to permit the lugs to slide



### A NEW COUPLING

1. Self-aligning
2. Perfect flexibility
3. Balanced for high speed
4. Highest efficiency even at maximum misalignment
5. Angular misalignment up to 6°
6. Parallel misalignment  $\frac{1}{16}$ " to  $\frac{3}{16}$ "
7. Runs on sprung shaft
8. Silent at all speeds

**ALLOY PRODUCTS CORP.**

221-241 MADISON ST. WAUKESHA, WIS.



**RUN THEM  
FASTER**



**FEED THEM  
FASTER**

## WEL-DON DOUBLE-END MILLS

WEL-DON Double-End Mills have a wide — and well-deserved — reputation for “cutting cutting costs.” You’ll be surprised how fast the hollow-ground flutes and double back-off permit you to plow cleanly through the work.

### *Cost Less—Work Faster*

HERE’S WHY. Backed by longest experience—the Original Double-End Mill. Quality Steel. Correctly Designed. Accurately Manufactured. Hardened by the latest and finest hardening equipment. And—they cost less.

PROVE IT—WRITE FOR CATALOG AND PRICES

**THE WELDON TOOL CO., 321 Frankfort Ave., Cleveland, Ohio**

## • • UNIVERSAL • •

### STANDARD DRILL BUSHINGS



A. S. A.  
Specifications

**LONG  
LIFE**

**LOW  
COST**

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ENGINEERING CO.**  
FRANKENMUTH, MICHIGAN

### COLLET CHUCKS for End Mills



### KEYWAY CUTTERS



### AND NITRIDED CENTER POINTS





## RIVETING?

**LINLEY NOISELESS ROTARY RIVETING MACHINES**

Assure Peak Production and Lower Maintenance, Rigid and Powerful. Bench and Floor Types. Motor or Belt Driven. There is a Linley machine for every riveting job.

Send Samples of your Work and we will furnish accurate estimate of production and quote cost of equipment.

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*Bulletin on Request.*

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GREENFIELD, MASS.



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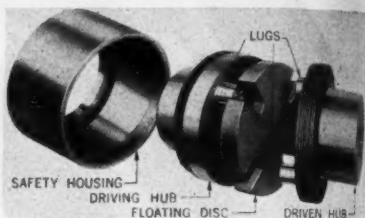


- SINGLE LEVER CONTROL
- CONE HEAD AND GEARED HEAD
- 14" TO 30" SWING

**GREAVES-KLUSMAN TOOL CO.** Cincinnati, Ohio

in them; it is this self-adjusting feature which permits the coupling to operate satisfactorily under conditions of misalignment.

While the coupling will operate efficiently at any degree of misalignment



**Lifetime Uniflex Coupling**

within its limits, the centrifugal action tends to make the coupling self-aligning due to the fact that the bone fiber disc has a tendency to float and find its own center. The fourth part is cover housing which acts as a guard. The long life of the coupling is evidenced by the fact that couplings which have been in continuous service for more than two years have shown no wear.

### Rewoldt Bench Grinder

The illustration shows a single-wheel, motor-driven bench grinder which has been placed on the market by the H. C. Rewoldt Company, 40 Piquette Ave., Detroit, Michigan. The grinder is of rugged construction and is of a size that was adjudged by the designer to be more universally adaptable.


The base is 8 x 12 in. The spindle, which is of nickel steel, is 13/16 in. in diameter and runs in Fafnir Seal Bearings. Power is provided by a 1/4-h. p.

(Continued on page 297)

## HINGES



VARIOUS WIDTHS  
and GAUGES

For  
**GUARDS  
CABINETS  
CASES  
BOXES**



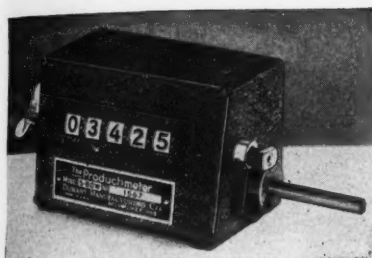
**BUTTS AND  
CONTINUOUS LENGTHS**

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4541 W. LAKE STREET    HARDWARE DIVISION    CHICAGO, ILLINOIS



## Keeping the Count On Production Machinery

Punch Presses    Milling Machines  
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Productimeter Counters give an accurate, automatic count.

Productimeters will also count objects on conveyors, or run through hoppers, and record strokes of engines, pumps, compressors and stokers.

The standard models include Stroke and Revolution Counters, Wire and Cord Measuring Machines, and Predetermined Counters for stopping machines at a pre-set count.

Send for catalog or tell us what you want to count.

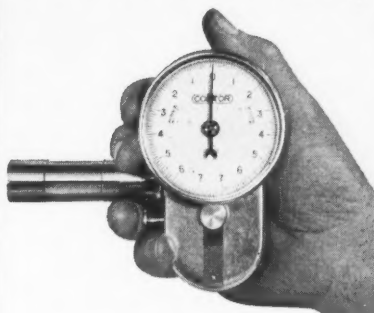
### DURANT MFG. CO.

1932 N. Buffum St.    173 Eddy St.  
Milwaukee, Wis.    Providence, R. I.

**Productimeters**

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## PRECISION .. Made Easy



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## COMTOR Precision Measuring Gages

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PRECISE  
ACCURATE  
DEPENDABLE  
DURABLE  
EASY TO OPERATE

*Let us figure on your  
Gaging requirements*

**The Comtor Company**  
WALTHAM, MASS.

**MEMORANDA**

1935

August, 1935

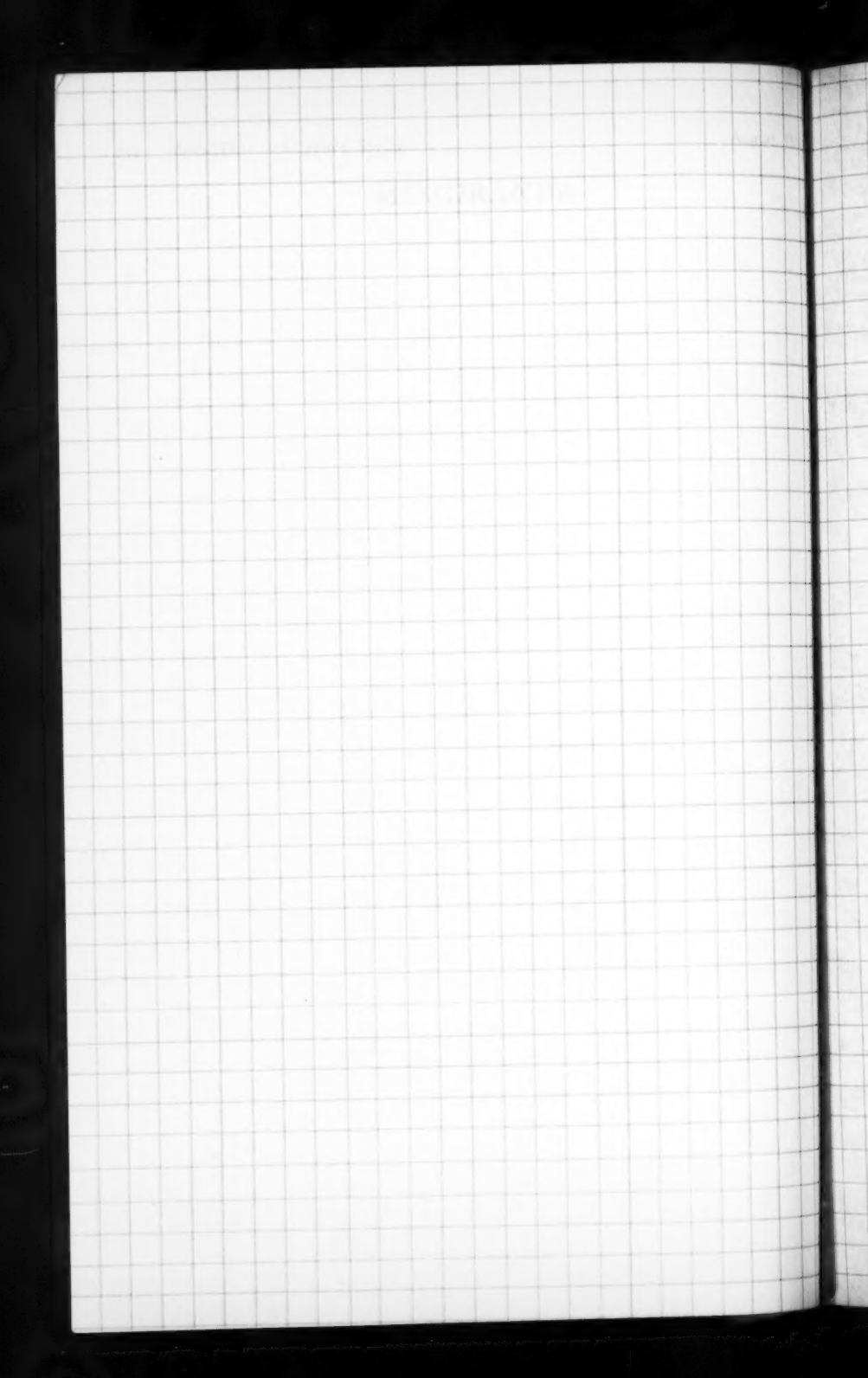
MODERN MACHINE SHOP 291

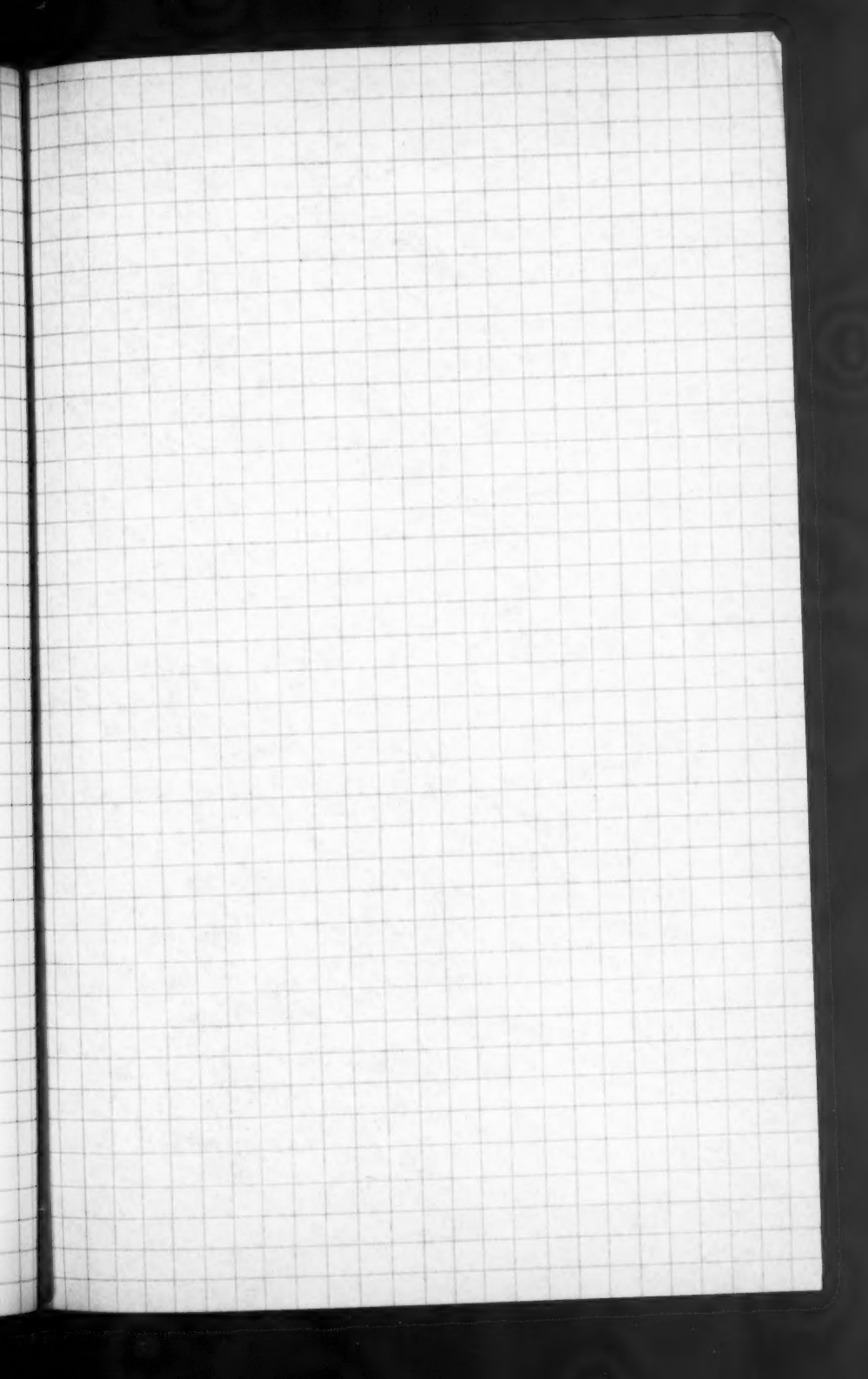
## MEMORANDA

**MEMORANDA**









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MACH  
CLEVELA

**BR**



Robbins & Myers 1750 r. p. m. motor and is transmitted by means of a V-belt with automatic take-up. The spindle speed is 2800 r. p. m., which, with a



Rewoldt Bench Grinder

1 x 8-in. wheel, is equal to 5,500 surface feet per minute.

The wheel dresser rest is so attached that it can be clamped in position by

hand, without the use of tools, thus making it easy for the user to keep the wheel sharp. Safety features consist of a wheel guard of gray iron and a belt guard of 20-ga. steel.

### Smith & Serrell Flexpin Coupling

Increased power capacity, longer life, and greater protection for the connected machines against shaft misalignments, shocks and vibrations are claimed for the 1935 improved type Flexpin Couplings announced by Smith & Serrell, 68A Washington Street, Newark, N. J.

The coupling consists of a bundle of steel laminations, copper coated to resist rust, and held in a slotted keeper by hardened steel cross pins welded in place. The sliding ends of the flexpins are longer, have greater area than formerly, and have thick phosphor bronze bearing strips welded to the outside spring laminations. The flexpins are held in place in one flange by a spring retainer ring (or by radial bolts in the larger sizes); while, in the other flange, hardened steel bushings, with rectangular broached holes to receive the long, sliding ends of the flexpins, are employed. These are locked in place permitting easy renewal, if necessary, after

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systems and for lubrication.

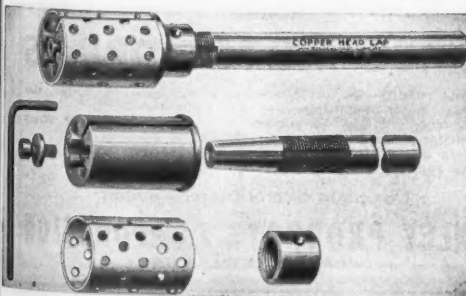
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May we show you these  
pumps at Booth 27?



Brown & Sharpe Mfg. Co.  
Providence, R. I.

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with Groetchen Copper Head Expansion Laps. Profitably used in hundreds of leading shops. Available in sizes from  $\frac{1}{8}$ " to  $2\frac{1}{2}$ ", graduated by sixteenths of an inch. Many other designs for special applications.

Write for Bulletin C 40

**GROETCHEN TOOL &  
MFG. CO.**

124 N. UNION ST., CHICAGO, ILL.

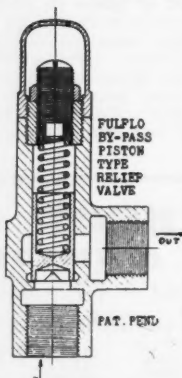


**Thread Measuring Wires—**  
 Gear Measuring Wires—Precision Gage Blocks, Plug Gages, Microgage Layout Tool, Micrometer Laps, Flat Laps, Cylindrical Laps, Steel Surface Plates, Shop Triangles, Sine Bars, Light Wave Equipments, Light Wave Micrometer, Light Wave Flatness Tester, Light Wave Deflection Bar and Special Gages.

Write Today For Illustrated Catalog  
**THE VAN KEUREN CO.**  
 WATERTOWN MASS.

## FULFLO Non-Chattering By Pass Piston Relief Valve

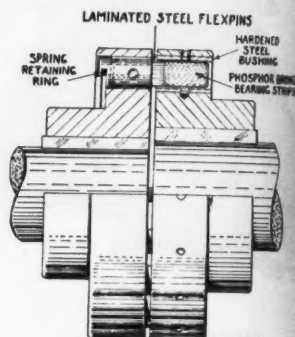
**T**HIS valve is made in pipe sizes from  $\frac{1}{2}$  to 3" and is suitable for pressures from 10 lbs. to 1,000 lbs. Adjustment can be made by removing cap and turning adjustment screw at top of valve. The cylindrical piston seat closes off the port in a shearing manner, and does not seat abruptly against the body of the valve, thereby, relieving a pounding or chattering noise as ordinarily caused by standard valves using a disc seat.



**Fulflo Specialties Co., Inc.**  
 BLANCHESTER OHIO

several years of service.

Load pressure between the bronze bearing strips and the sides of the broached bushings is thus separated from the pressure due to centrifugal force, as the laminated springs contact with the upper, inside surface of the bushings as well as with the sides of

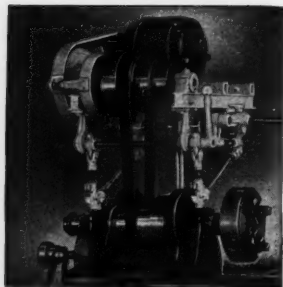


Smith & Serrell Flexpin Coupling

the bushings. These improved flexpins are hardened steel bushings, of such sizes that they can be employed in any bushed laminated-pin type couplings supplied by Smith & Serrell since 1925.

## Williams "Non-Sparking" Safety Wrench

Especially adapted for use in industries where great fire hazards exist, the "Non-Sparking" Safety Wrench shown in the illustration has been announced by J. H. Williams & Co., 75 Spring St., New York, N. Y. The wrench is drop-forged from beryllium-copper and heat treated, and is said to be not only tough and hard, but practically as strong as steel wrenches of similar size and design.



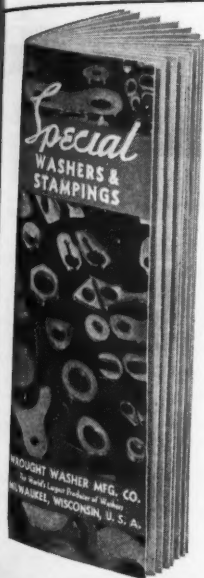
## REMCO MOTOR DRIVES

Complete rigidity—no overhang—no strain on beds, frames, etc. Universal motor mounting—use any motor—not built special, change from one tool to another if desired. V Belt or Chain from motor. Complete guards—quick belt adjustment. Complete line of Drives from Hack Saws to 42" Lathes, etc.—Quickly applied.

Complete Literature on Request

**MANLEY PRODUCTS CORPORATION**  
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**BRONZE BUSHINGS • BEARINGS  
MACHINED AND CENTERED BRONZE BARS  
ANTI-FRICTION METAL**



**W**HY bother to make bronze bearings when you can get instantly any quantity of any or all of 500 different sizes of completely machined and finished—ready for assembly—Bunting Bronze Standardized Bearings? Write for catalog.

**Bars**—Are you still using rough cast cored and solid bronze bars? Are you still using 12" bars? If so investigate the advantages and economies in Bunting machined and centered 13" Bronze Bars. There are 121 stock sizes.

**Babbitt**—The next time you buy industrial anti-friction metal try Bunting Babbitt. It will surprise and please you. Ask any leading mill supply wholesaler or write for catalog.

**THE BUNTING BRASS & BRONZE CO.**

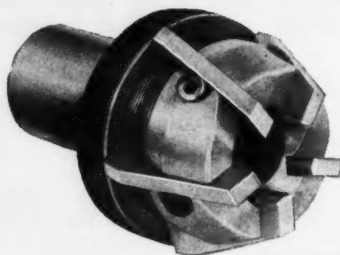
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## .. GEARS ..

Small and Medium Sizes  
Accuracy—Prompt Service  
Hydraulic Operated  
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Aeroplane Parts

**The Taylor Machine Co.**  
CLEVELAND, O., EST. 1907



### GENESEE ADJUSTABLE HOLLOW MILLS

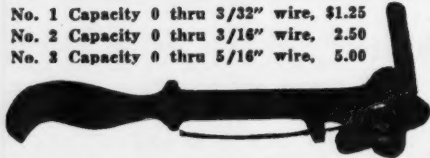
*Are Cutting Costs Everywhere*  
**SEVEN DIFFERENT STYLES**

Have Genesee cut your costs. We design and manufacture hundreds of special and multiple operation production tools. Send samples or blueprints now. Write for catalogue.

**GENESEE MFG. CO., Inc.**  
141 No. Water St., Rochester, N. Y.

## HERE'S A REAL SPRING WINDER!

- No. 1 Capacity 0 thru 3/32" wire, \$1.25
- No. 2 Capacity 0 thru 3/16" wire, 2.50
- No. 3 Capacity 0 thru 5/16" wire, 5.00



**HJORTH LATHE & TOOL CO.** 12 BEACON STREET  
WOBURN, MASS.

Non-corroding, non-rusting, the "Non-Sparking" safety wrench is finished in green enamel with the heads brightly polished and the sizes stamped thereon.



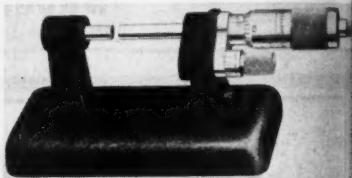
Williams "Non-Sparking" Safety Wrench

The wrench is available in both the single and double-head pattern, in wide range of sizes.

The necessity of safety wrenches in any work where a chance spark might cause an explosion has been demonstrated many times.

### Brown & Sharpe Bench Micrometer Caliper

The Brown & Sharpe Manufacturing Company, Providence, R. I., has announced the inclusion in its line of



Brown & Sharpe Bench Micrometer Caliper

Bench Micrometer Caliper, No. 24853. It is said to be a particularly useful tool for inspectors, watchmakers, manufacturing jewelers, and so on, for accurate measurements.

This Brown & Sharpe Bench Micrometer Caliper reads to ten-thousandths

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AL-O

No. 3 of the Series

## WHAT ARE THE VARIOUS COATED ABRASIVES?

### What Are Their Uses?

#### ALUMINOUS OXIDE PRODUCTS (CLOVER YELLOW STRIPE)

By E. B. GALLAHER  
Editor, Clover Business Service  
Treasurer, Clover Mfg. Co.

**E**ACH AD of this series deals with one kind of abrasive and describes its special uses. We have already dealt with Flint and Garnet—today we talk about Aluminous Oxide.

• **ALUMINOUS OXIDE**—an electric furnace product — probably the hardest, toughest and sharpest abrasive material in general use.

While it is the outstanding abrasive employed in all machine shops, it is also largely employed for woodworking, especially when production is the chief objective. It is supplied for woodworking on paper backings, in sheets, rolls, belts and discs; also on cloth and combination backings, in rolls, belts and discs.

• **AL-OX FINISHING PAPER.** 9x11" sheets, made in grits No. 9/0 to No. 1/0 inclusive. Employed for hand finishing.

• **AL-OX CABINET PAPER.** 9x11" sheets made in grits No. 4/0 to No. 2 inclusive. For all kinds of hand sanding.

• **AL-OX PAPER ROLLS.** Made in grits No. 6/0 to No. 4 inclusive. For all wood-working machine operations, including belts, discs and drum sanders.

• **AL-OX "J" CLOTH ROLLS.** Made in grits No. 4/0 to No. 1/2 inclusive. Recommended for machine sanding, where extreme flexibility is desired, such as sanding irregular or curved surfaces.

• **AL-OX "X" CLOTH ROLLS.** Made in grits No. 3/0 to No. 3 inclusive. For hardwood machine-sanding and in all heavy operations where large production is required.

• **AL-OX COMBINATION.** Made in grits No. 1/0 to No. 3 1/2 inclusive. Recommended for jobs which are too heavy for paper, but not heavy enough to require the use of standard cloth.

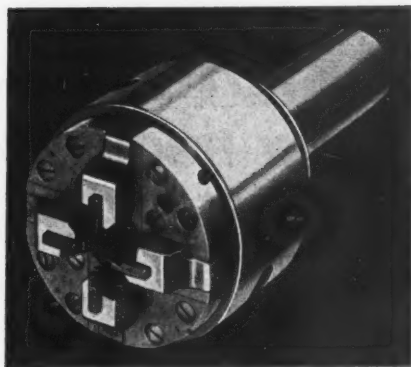
• File these ads for reference.

NEXT ISSUE WE  
WILL DESCRIBE  
AL-OX BELTS  
AND DISCS.

**CLOVER MFG. CO.**

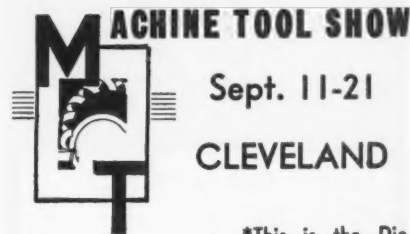
NORWALK,  
CONN.

Also makers of the famous  
**CLOVER GRINDING AND  
LAPPING COMPOUNDS**



## Come and see this remarkable DIE HEAD

at the



Sept. 11-21

CLEVELAND

\*This is the Die Head in which new chasers replace dull chasers. Less SET-UP time. Fewer adjustments. Less DOWN TIME. Greater net production. More uniform quality of threads. Lower costs. Help the unskilled operator. Eliminates threading troubles. Simplifies chaser stock.



**The Eastern Machine Screw Corp.**

38-58 Barclay St.

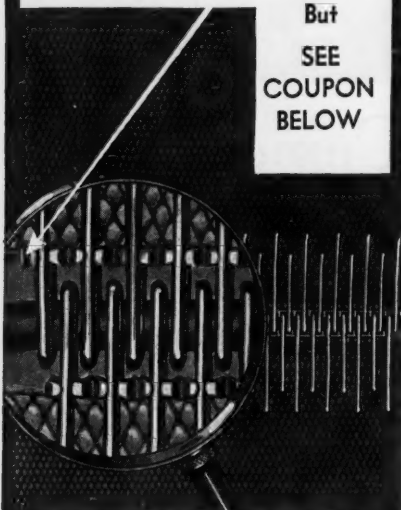
New Haven, Conn.

**Safety**  
REG. U. S. PAT. OFF.

## BELT HOOKS

With The Steel Binder Bars  
Will not be exhibited at the  
MACHINE TOOL SHOW

But  
SEE  
COUPON  
BELOW



**SAFETY BELT-LACER CO.,  
TOLEDO, OHIO.**

Send us a belt end laced with  
Safety Belt Hooks, and explain  
why there is no waste and  
how we save time, money and  
belts through their use.

SIGNED.....

POSITION.....

CITY.....

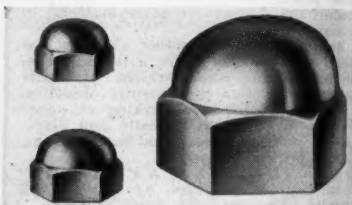
STATE.....

of an inch direct by an auxiliary thumb  
and has a range of measurements of 1/16  
to 1 inch. The parts of ten-thousandths  
can be estimated readily. There are no  
gears or intricate mechanisms to get out  
of order and the readings are taken  
easily and quickly. The tool is furnished  
with a Ratchet Stop, and the base is  
rigid and heavy to prevent the tool  
from being upset easily.

### Parker-Kalon Cap and Acorn Nuts

A complete line of cap and acorn nuts  
produced by a cold forging process has  
been announced by Parker-Kalon Cor-  
poration, 200 Varick Street, New York  
N. Y.

Application of the forging process is  
said to produce a nut considerably  
stronger than the ordinary milled-from-

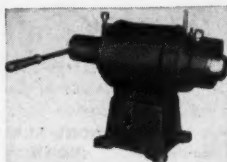


Parker-Kalon Cap and Acorn Nuts.

the-bar variety. Die-formed to uniform  
shape, the nuts have a finish free from  
tool marks and sufficiently smooth to  
eliminate the need for polishing before  
plating or buffing after plating.

Holes are countersunk before tapping,  
and the tapping itself is held to close  
tolerances. The base of the nuts are  
faced off and the corners chamfered,  
permitting them to seal flush without  
danger of marring when used on highly  
finished surfaces. In the stock finish

### IDEAL SPEED LATHES



FOR LAPPING  
FINISHING  
POLISHING  
SMALL PARTS

2 Speed Motor  
Automatic Brake  
Collet or 3 Jaw  
Chucks. Hand  
operated or au-  
tomatic. Write  
for Cir. 351.

**SCHAUER MACHINE CO.**  
905-7 Broadway Cincinnati, Ohio

# THE SUPERHIGH SPEED Sensitive Friction Clutch

# Ettco-Emrick



## TAPPING ATTACHMENT

"I never had any idea," said a user, "that a tapper could be so quiet, so smooth and so free from vibration, especially when reversing at 3500 r.p.m."

The answer is simple enough—ALL HELICAL GEARS RUNNING IN A FORCED OIL BATH.

And then the ball and nitralloy bearings, the asbestos cone clutches and oil pumping system insure a longer life than one could reasonably expect.

**TRY ONE** Get Used to Practical High Speed.  
Shipped on Thirty Day Trial.

No. 100— $\frac{3}{8}$ " capacity—For delicate small tapping.

No. 200— $\frac{1}{4}$ " capacity—For all-around use.

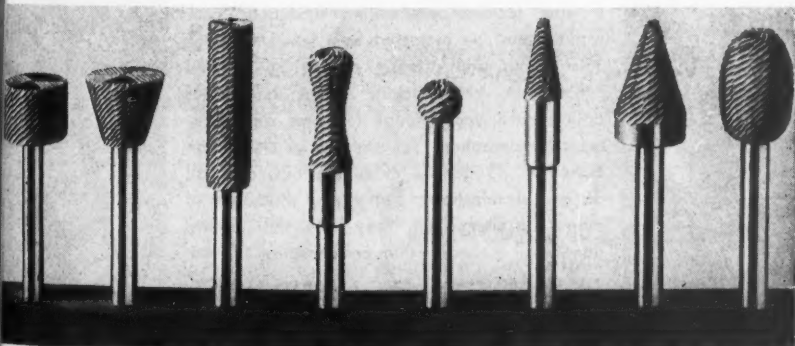
Write for Descriptive Bulletin

## ETTCO TOOL CO., Inc.

594 JOHNSON AVE.

BROOKLYN, N. Y.

## FORD HAND CUT ROTARY FILES



Just a few of the many standard shapes which are carried in stock.

Write for full information.

## M. A. FORD MFG. CO.

108 HARRISON STREET

DAVENPORT, IOWA

of natural brass, seven blank sizes are available with standard screw-thread sizes from No. 6 to  $\frac{1}{8}$  inch. Plated finishes can be furnished on order, as well as nuts of aluminum, copper, and so on, in standard or special threading.

### Mercil Type Centrifugal Dryer

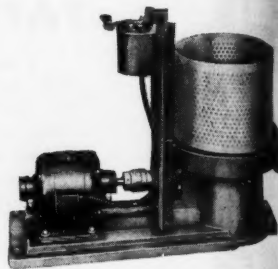
Compactness, efficiency and speed in drying basket loads of plated work are features of the Mercil Type Centrifugal Dryer introduced by Hanson-Van Winkle-Munning Co., Matawan, N. J.

Available in two dryer shell sizes—12x12 in. and 18x18 in.—this dryer is particularly well adapted for use in conjunction with plating barrels as the small floor space required—17x33 in.—allows it to be set close to the barrel. Transfer of work is a simple operation and pieces to be dried may be placed directly in the perforated shell or in a separate basket which fits the shell.

Power for driving the turntable at 600 r.p.m., is obtained from a  $\frac{1}{2}$ -h.p. motor through a pair of bevel gears. Four roller bearings of ample size support the drive shaft and turntable without end play, reducing friction and vibra-

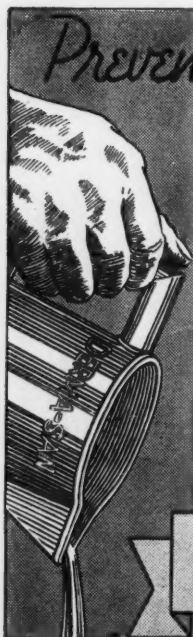
tion to a minimum. Adequate lubrication is provided by running the gears in a bath of absorbed oil which also circulates to the bearings.

A conveniently located reverse



Mercil Type Centrifugal Dryer

switch allows the operator to control the direction of rotation at will. It is not necessary to bring the basket to a stop before operating the control which reverses the movement.



## Preventing Oil Dermatitis is cheaper than Curing it

If your factory uses cutting lubricants, your workers must be protected from Oil Dermatitis. This serious skin disease, caused by infected cutting oils, costs factory owners millions of dollars each year through lost time and workmen's compensation. Yet one pint of Derma-San added to 35 gallons of cutting oils, ends all danger of infections. That's why thousands of plants use Derma-San. They know that prevention for all is cheaper than compensation for one.

The HUNTINGTON



LABORATORIES Inc.

HUNTINGTON

INDIANA

TORONTO, ONT. 72-78 Dundas St.

999 S. Logan St. DENVER, COLO.

• DERMA-SAN •  
DISINFECTANT

ALSO EXCELLENT FOR ALL GENERAL PLANT SANITATION







## "Alnor" PYROMETERS

For the Hardening Furnace

Price complete with protection tube and up to \$36.00

Write for Information

ILLINOIS TESTING LABORATORIES, Inc.  
146 W. Austin Ave. CHICAGO, ILL.

## CENTERLESS GRINDING

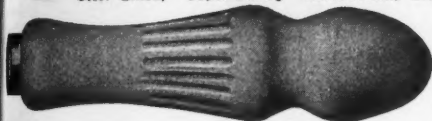
Accuracy — Prompt Service

### COMMERCIAL CENTERLESS GRINDING CO.

6538 CARNEGIE AVE., CLEVELAND

## OSGOOD'S New UNIVERSAL Balanced-Grip Handle.

Steel Lined, "Super-Strong" construction, with horizontal gripping grooves.



Never Cramps Never Slips Easy Grip

Write for price list. Sample handle for 10c, or handle and FILEGRIP for 25c.

J. L. OSGOOD HANDLE CO.

43 PEARL ST.

BUFFALO, N. Y.

100% efficient, for strength, durability, and economy for every service where handles are used. Highest efficiency for all horizontal or angular motions, for files, saws, all types of metal and wood turning, spinning, burnishing tools, etc. Also highest efficiency for all tools requiring circular motion, with the gripping grooves make easy grip with powerful force for screw drivers having flat file tapered shank inserted. For socket wrenches—rapidly and firmly tightening bolts and nuts in close quarters. For hand reamers, broaches, taps, wood bits and gimlets and all tools requiring circular motion. Faster and more economical than the old clumsy wrenches.



NATIONAL Tool Salvage Service will save you approximately

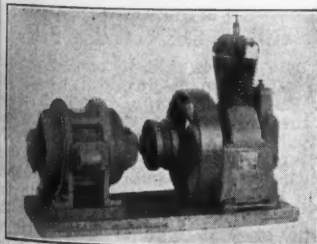
# 50%

on Milling Cutters, Drills and Reamers.

## NATIONAL TOOL SALVAGE COMPANY

3818 Beaubien St.

Detroit, Michigan



## FLEXOID COUPLINGS

Illustrated as applied to compressor by The Worthington Pump and Machinery Corp.

THE SMITH POWER TRANSMISSION CO.

1213 W. 3rd St.

Main 94501

CLEVELAND



OHIO

## Consider These Superior BATH Qualities



1. High Finish  
in Thread  
Grinding.
2. Smooth  
Chamfering.
3. Highly Polished  
Flutes.

Qualities which result in accurate, keen cutting edges which stay sharp longer and produce **MORE HOLES PER GRIND.**

Why not order your next lot of taps from BATH? Or better yet, ask to have a BATH engineer come in and discuss your tapping problems with you. We are sure your time will be profitably spent.

### John Bath & Co., Inc.

*Taps—Chasers—Gages*  
**WORCESTER, MASS.**

## Acme Sure Flow Pump

The Acme Machine Products Company, Inc., Muncie, Ind., has introduced a new line of Acme Sure Flow Pumps. The pumps handle coolants, water, oils and fluids filled with abrasives and can be applied to any general industrial application which necessitates the transfer of liquids.

Sure Flow Pumps are said to incorporate many new features of design and



Acme Sure Flow Pump

adaptability to the machine tool field. They maintain prime without submerging part of the pump in the fluid to be pumped and can be installed at any convenient location on a machine tool with a single line of pipe to the fluid reservoir.

Belt drive models are available in 10, 20, 50 and 100 gallons per minute capacities. Direct motor drive models are available in 10, 20, 50 and 100 gallons per minute capacities. All models are manufactured for both low pressure and high pressure duty. Either horizontal or vertical base for side wall mounting is optional.

## Gilmer Oil-Resisting Belt

A belt that is said to be 100 per cent oil-resistant, made in both V-type and Flat Kable Kork type, has been placed on the market by the L. H. Gilmer Company, Tacony, Philadelphia, Pa. Mechanically, the belt has the same qualities as the regular Gilmer rubber fabric belt. The materials used in this belt are such, however, that either the V-type or Flat type of belt is oil resisting and practically impervious to the

# "OUTWEARS the best Bronze Metal"

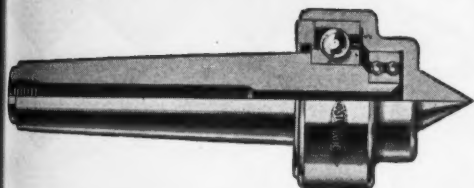
20 years without  
a drink—



## ARGUTO OILLESS BEARING CO.

Wayne Junction, Philadelphia, Pa.

### STURDIMATIC LIVE CENTER for LATHES, GRINDERS and MILLING MACHINES



It turns with the work.  
Eliminates friction of dead  
center.

Lowest possible overhang  
prevents vibration and  
chatter.

*Write for Catalog and  
Free Trial Offer*

STURDIMATIC TOOL COMPANY

5222 THIRD ST., DETROIT, MICHIGAN



Manufacturers of

## LATHES

and

## SPECIAL MACHINERY

## IRON FOUNDERS

SEE . . .  
OUR EXHIBIT

at the

## MACHINE TOOL SHOW--BOOTH 800

## THE SPRINGFIELD MACHINE TOOL CO.

Springfield, Ohio

destructive action of oil in connection with rubber, which has been the bane of successful operation of this type of belt heretofore.

### Carpenter Offers Free Tool Steel Selector

A new, easy, and safe method of selecting tool steels is provided by the wall chart selector now being offered to mechanical executives and engineers by The Carpenter Steel Company, 111 Bern

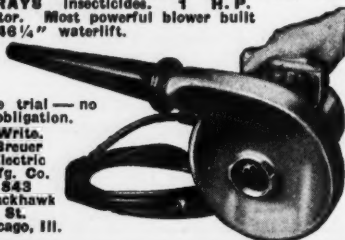
Street, Reading, Pa.

The chart is ideal for use in rooms as a ready reference. It shows a glance, which steel to select for a tool. In addition, the chart explains how to get greater wear resistance.

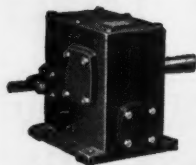
### BREUER'S BALL BEARING TORNADO PORTABLE ELECTRIC BLOWER

**BLOWS** powerful 275 M.P.H. blast of air into motors and machines. Drives out dust and dirt. Prevents fire, friction, burnouts and shut-downs. **VACUUM** cleans stock bins, shelves, overhead pipes, walls, rugs, etc. **SPRAYS** insecticides. 1 H.P. motor. Most powerful blower built—46 1/4" waterlift.

Free trial—no obligation.  
Write,  
Breuer  
Electric  
Mfg. Co.  
543  
Blackhawk  
St.  
Chicago, Ill.



### Ohio Speed Reducers



Made in 4 sizes. Complete ball and Timken bearing equipped. Hardened and ground worms. Bronze worm gears. Absolutely oil tight.

Write for prices and catalog.

### THE OHIO GEAR COMPANY

1337 E. 179th St., Cleveland, Ohio



### Carpenter Tool Steel Selector.

toughness, hardening accuracy, retempering, and increased production of tool steels.

This convenient tool steel wall chart is printed in four colors, 20x30 inch, and is equipped with 100 hangers. One of the selectors will be sent free to any mechanical executive engineer upon request.

### "EDGEMONT"

SERVICE TESTED

### FRICTION CLUTCHES

#### EXPANDING "TYPE B"

The economy of using the Improved "Type B" Clutch is evident from the start. Low in cost and long lived it is adaptable to a wide variety of applications. Furnished in Pulleys, Extended Sleeves and Couplings.

Write us now for Catalog "H"

### The Edgemont Machine Co.

2100 HOME AVE., DAYTON, OHIO



CLUTCH PULLEY